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Racial Equity Analysis: Access to Permanent Housing and The Vulnerability Index – Service Prioritization Decision Assessment Tool (VI-SPDAT)

Mary Ann Priester

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RACIAL EQUITY ANALYSIS: ACCESS TO PERMANENT HOUSING AND THE
VULNERABILITY INDEX – SERVICE PRIORITIZATION DECISION ASSESSMENT
TOOL (VI-SPDAT)

by

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DEDICATION

First, I dedicate this dissertation to my mother, Susan Ralph, who taught me persistence and a strong work ethic and believed in and supported me unconditionally. Even though she did not get to see me complete my doctoral studies and dissertation, I know she is somewhere out there celebrating and so proud of my accomplishments.

Second, I dedicate this work to my husband, Hunter, and son, Elijah. Thank you for the sacrifices you have made that have enabled me to pursue this dream. Your love has been the inspiration that fueled me to complete this process.

Finally, I dedicate this work to anyone who is or has been homeless. Your experiences and insights have been integral to this study. Your resilience has been an inspiration. I am committed to working alongside you to end homelessness and ensure that all people have access to safe, decent, and affordable housing.

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ABSTRACT

Purpose: This study aimed to replicate and extend national research within the local context of the Charlotte-Mecklenburg Continuum of Care by using propensity score methods to examine the relationships between race, program outcome, and housing prioritization among subpopulations of individuals experiencing homelessness.

Methods: This study used secondary data analysis and propensity score methods to examine deidentified client-level Homeless Management Information System (HMIS) data collected from January 1, 2016 – December 31, 2021 by the Charlotte-Mecklenburg Continuum of Care (CoC).

Results: Findings indicate that Whites are more likely to exit homeless services programs to temporary or institutional destinations vs. permanent housing situations.

Unaccompanied youth and individuals who reported experiencing domestic violence were more likely to exit to a permanent housing destination compared to non-youth and individuals who did not experience domestic violence, respectively. For veterans, White veterans had a higher probability of exiting to a temporary situation while Black veterans had a higher probability of exiting to a permanent destination. When examining VI-SPDAT total score, Blacks scored 0.50 points lower than Whites, unaccompanied youth scored 2.20 points lower than non-youth, veterans scored 0.90 points lower than non-veterans, and those who experienced domestic violence scored 1.21 points higher than

those who did not experience domestic violence. In addition, in some models, subscale scores varied based on race and subpopulation status.

Conclusion: Race and sub-population status significantly predicted VI-SPDAT total score. The variation in subscale scores by race and subpopulation suggests that the VI-SPDAT and its subscales may lack measurement equivalence. Individual item analysis by race and subpopulation is needed to better understand disparities in responses. Such analyses could be used to inform tools and processes to assess vulnerability across groups of persons experiencing homelessness.

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LIST OF ABBREVIATIONS

COC	Continuum of Care
HMIS.....	Homeless Management Information System
HUD	United States Department of Housing and Urban Development
PIT.....	Point in Time Count
VI-SPDAT	Vulnerability Index-Service Prioritization Decision Assistance Tool

CHAPTER 1

INTRODUCTION

1.1 Rationale for Study

A civic scholarship paradigm asserts that civic scholarship draws on one's professional expertise for the improvement of civil society by investing in scientific knowledge production that has the potential to facilitate action and change within local, national, and global contexts (Checkoway, 2008; Coulton, 2005). Social Work research which is often focused on persistent social problems such as systemic inequity and homelessness conducted within the paradigm of civic scholarship can be used to frame social and public policy and inform solutions and public discourse for these critical problems (Ansley & Gavena, 1997). Recent research from the Center for Social Innovation: Supporting Partnerships for Anti-Racist Communities (SPARC) posits that centuries of systemic and institutional racism, including discriminatory and segregationist policies and practices in housing, finance, education, employment, health care, and criminal justice have greatly restricted access to opportunities for upward mobility, building wealth, and breaking intergenerational cycles (Olivet, Dones, & Richar, 2018). These factors not only influence who becomes homeless but also how homeless service systems respond to homelessness. Homeless service system practices, policies, assessment tools, and processes have the potential to impact both how long a person stays homeless and their likelihood of returning to homelessness once housed.

That is, homeless service systems may, by design, perpetuate systemic inequity through system policies and procedures and assessment tools that favor White persons.

The Vulnerability Index–Service Prioritization Decision Assistance Tool (VI-SPDAT) has been one of the most widely utilized assessment tools to prioritize single adults, youth, and families with minor children for services (De Jong, 2022). In the early 2000s, Common Ground (now Community Solutions), a housing and human services agency, employed a housing first model to house persons experiencing homelessness in New York City (Kanis, 2007; Roncarati, 2016). In an effort to develop a process to prioritize individuals for scarce housing resources, Community Solutions utilized high risk for mortality criteria developed by the Boston Healthcare for the Homeless Program (BHCHP) to develop a self-report survey called the Vulnerability Index (VI; Hwang, Lebow, Bierer, O’Connell, Orav, & Brennan, 1998; Kanis, 2007). Individuals who scored the highest on the survey were prioritized for housing (Kanis, 2007). In 2010, Community Solutions and the Department of Housing and Urban Development (HUD) partnered on the 100,000 Homes Campaign and this tool’s usage was scaled through adoption by communities participating in the effort who used the VI to prioritize individuals for housing resources in their communities (Leopold & Ho, 2015). The tool served as a catalyst and as a community organizing tool for efforts to address homelessness in communities across the country (Roncarati, 2016). The intent of the high risk for mortality criteria developed by BHCHP was never intended to determine resource allocation and the VI was not intended to replace the high risk for mortality criteria created by BHCHP (Roncarati, O’Connell, Hwang, Baggett, Cook, Krieger, & Sorenson, 2020).

The Service Prioritization Decision Assistance Tool (SPDAT) is a common assessment and intake tool developed for use by professionals and paraprofessionals to assess the needs of individuals and families experiencing homelessness and to determine the most appropriate housing intervention needed to resolve their homelessness (OrgCode, n.d.; Maricopa Association of Government, 2013). It was developed via expert review of intake and assessment tools, existing peer review literature, beta testing which utilized both experimental and control groups, and independent external evaluations (Maricopa Association of Government, 2013; OrgCode, n.d.).

In 2013, Community Solutions partnered with OrgCode to deploy the VI-SPDAT, a triage tool that combined the SPDAT and the VI (OrgCode, n.d.). The tool, while beta tested in multiple communities, was not validated prior to its initial release (OrgCode, n.d.; Rothcarati, 2016). The intent was to develop a tool that could quickly determine individual acuity in communities that lacked the resources to conduct the full SPDAT but it was never intended to be an assessment tool (DeJong, 2021; OrgCode, 2015). Despite its wide adoption, more recently, the VI-SPDAT has been criticized as being unreliable and racially biased (Brown, Cummings, Lyons, Carrion, & Watson, 2018; Cronley, 2020; Shinn & Richard, 2022).

Research from the Center for Social Innovation examined homeless service system Coordinated Entry assessment data from four cities to evaluate the potential of the VI-SPDAT, an internationally used housing and service prioritization tool, to perpetuate racial inequities. The findings from this study suggest that race is a key factor in receiving a higher score on the VI-SPDAT with Whites scoring higher than persons of color (Wilkey, Donegan, Yampolskaya, & Cannon, 2019). A high VI-SPDAT score

indicates more medical vulnerability and a need for more intensive wraparound services (Wilkey, Donegan, Yampolskaya, & Cannon, 2019). Thomas and colleagues (2020) had similar findings in their examination of VI-SPDAT scores among chronically homeless single adults. Their findings indicate that on average, White individuals scored higher than Black individuals on the VI-SPDAT and were housed at higher percentages than Black individuals in permanent supportive housing (Thomas, Hutchison, Lane, Carman, & Schulkind, 2020). Both of the highlighted studies from the Center for Social Innovation (2018, 2019) analyses indicate a need for sub-population analysis while Thomas and colleagues (2020) suggest a need to examine and review use of the tool in the local context.

Mecklenburg County is a large urban area in the state of North Carolina. It is home to the largest city in the state, Charlotte. In addition to Charlotte, Mecklenburg County includes six municipalities: Cornelius, Davidson, Huntersville, Pineville, Matthews, and Mint Hill (Mecklenburg County Government, n.d.). For county and state population characteristics, see Table 1.1.

Table 1.1
Local and State Population Characteristics

	Mecklenburg County	North Carolina
Population, Census, April 1, 2020	1,115,482	10,439,388
Persons under 5 years	6.60%	5.80%
Persons under 18 years	23.30%	21.90%
Persons 65 years and over	11.50%	16.70%
Female persons	51.90%	51.40%

White alone	57.30%	70.60%
Black or African American alone	33.00%	22.20%
American Indian and Alaska Native alone	0.80%	1.60%
Asian alone	6.30%	3.20%
Native Hawaiian and Other Pacific Islander alone	0.10%	0.10%
Two or More Races	2.50%	2.30%
Hispanic or Latino	13.80%	9.80%
White alone, not Hispanic or Latino	46.10%	62.60%
Veterans, 2015-2019	47,874	659,584
Foreign born persons, 2015-2019	15.40%	8.00%
Housing units, July 1, 2019 (V2019)	466,911	4,747,943
Owner-occupied housing unit rate, 2015-2019	56.40%	65.20%
Median value of owner-occupied housing units, 2015-2019	\$238,000	\$172,500
Median selected monthly owner costs - with a mortgage, 2015-2019	\$1,494	\$1,314
Median gross rent, 2015-2019	\$1,146	\$907
Households, 2015-2019	411,097	3,965,482
Persons per household, 2015-2019	2.58	2.52
Language other than English spoken at home, persons age 5 years+, 2015-2019	20.00%	11.80%
Households with a computer, 2015-2019	94.40%	89.10%

Households with a broadband Internet subscription, 2015-2019	88.20%	80.70%
High school graduate or higher, persons age 25 years+, 2015-2019	90.30%	87.80%
Bachelor's degree or higher, persons age 25 years+, 2015-2019	45.40%	31.30%
With a disability, under age 65 years, 2015-2019	5.40%	9.40%
Persons without health insurance, under age 65 years	13.20%	13.40%
Median household income (in 2019 dollars), 2015-2019	\$66,641	\$54,602
Persons in poverty	10.30%	13.60%

From "QuickFacts: Mecklenburg County, North Carolina and North Carolina," by U.S. Census Bureau, 2020 (<https://www.census.gov/quickfacts/fact/table/NC.mecklenburgcountynorthcarolina/PST045219>).

Per the United States Department of Housing and Urban Development (HUD), a Continuum of Care (CoC) is the local planning body designated to carry out the responsibilities outlined in the CoC Program Interim Rule including operating the CoC, coordinating the homeless housing and services system in a particular geographic area, designating a Homeless Management Information System (HMIS) Lead and software, and designing and implementing the local process used to apply for CoC Program funds (HUD, 2014). North Carolina consists of 100 counties and twelve CoCs. The Charlotte-Mecklenburg Continuum of Care includes all municipalities within the Mecklenburg County geographic area.

According to 2020 Point in Time (PIT) Count data, the Charlotte-Mecklenburg homeless population represents approximately 17% of the persons who are homeless in the state of North Carolina (HUD, 2021). For a comparison of Charlotte-Mecklenburg CoC and overall North Carolina homeless population characteristics, see Table 1.2. In general, the characteristics of the homeless population of the Charlotte-Mecklenburg CoC are similar to the overall homeless population of North Carolina. Compared to the overall state population, the Charlotte-Mecklenburg CoC does have a higher prevalence of persons under the age of 18 (19.1% vs. 17.6%), those who identify as female (40.6% vs. 38.9%), people who meet the criteria for chronic homelessness (17.8% vs. 13.7%) and lower prevalence of persons over the age of 24 (74.2% vs. 76.3%), those who identify as Hispanic/Latin-x (2.7% vs. 4.9%), and homeless veterans (7.6% vs. 8.5%). The most notable differences are related to race with a much higher proportion of people who identify as Black or African American in the Charlotte-Mecklenburg CoC (78.5% vs. 51.26%) and a much lower proportion of those who identify as White, Non-Hispanic (16.7% vs. 43.8%). It is important to note in this study, Black refers to both people who identify as Black and/or those who identify as African American. The terminology is used in this document as it appears in the cited literature. For example, the HUD HMIS race category is Black or African American, while some literature uses only Black as a racial category. Black, Indigenous, Person of Color (BIPOC) includes a broad spectrum of racial identities and while some research cited in this document does focus on BIPOC, this study focuses exclusively on people who identify as Black or African American (Black) and White, non-Hispanic (White).

Table 1.2*Charlotte-Mecklenburg CoC and North Carolina Homeless Point in Time Count Data, 2020*

	Charlotte/ Mecklenburg CoC	NC
Overall Population	1,604	9,280
Under 18	307 (19.13)	1,634 (17.60)
Age 18 to 24	107 (6.67)	561 (6.05)
Over 24	1,190 (74.20)	7,085 (76.34)
Female	652 (40.65)	3,614 (38.94)
Male	949 (59.16)	5,646 (60.84)
Transgender	3 (0.18)	18 (0.19)
Gender Non-Conforming	0 (0.00)	2 (0.02)
Non-Hispanic/Non-Latino	1,560 (97.25)	8,820 (95.04)
Hispanic/Latino	44 (2.74)	460 (4.95)
White	269 (16.77)	4,060 (43.75)
Black or African American	1,260 (78.55)	4,757 (51.26)
Asian	4 (0.24)	30 (0.32)
American Indian or Alaska Native	8 (0.49)	93 (1.00)

Native Hawaiian or Other Pacific Islander	0 (0.0)	20 (0.21)
Multiple Races	63 (3.92)	320 (3.44)
Chronically Homeless	286 (17.83)	1,272 (13.71)
Homeless Veterans	123 (7.66)	798 (8.59)
Homeless Unaccompanied Youth (Under 25)	88 (5.48)	485 (5.22)
Homeless Parenting Youth (Under 25)	16 (0.99)	89 (0.96)

From "PIT and HIC Data Since 2007," by HUD, 2021 (<https://www.hudexchange.info/resource/3031/pit-and-hic-data-since-2007/>).

According to local Continuum of Care (CoC) Point-in-Time (PIT) Count data, 79% of people experiencing homelessness in the local CoC identify as Black or African American. American Community Survey (ACS) data from 2019 indicates that only 33% of the general population in the CoC is Black or African American. Of those persons, 46% have annual incomes that are below federal poverty thresholds. These local data are consistent with other community and national poverty and homelessness data which demonstrate that persons who identify as Black or African American experience homelessness rates that exceed their respective rates of poverty (Olivet, Dones, & Richar, 2018). Such data suggests that poverty alone is not sufficient to account for the inequity in homelessness rates we see among people who identify as Black or African American. While the over-representation of Black or African American persons within homeless services systems is inextricably linked to systemic and institutional racism, prioritization of groups by risk has the potential to perpetuate structural racism by limiting access to resources available through homeless services systems (Olivet, Dones, & Richar, 2018; Kapadia, 2022; Shinn & Richard, 2022).

In December 2020, the creators of the VI-SPDAT, OrgCode, announced that they would be phasing out support for the VI-SPDAT (DeJong, 2020). The announcement included a call to create a tool or approach to replace the VI-SPDAT with a homelessness response tool and approach that addresses racial and gender inequities (DeJong, 2020, 2021). The call to move away from using the VI-SPDAT to a more equitable, community-based approach to prioritization creates the opportunity to reconceptualize how homeless service systems approach the allocation of scarce resources but it also has left communities who use the VI-SPDAT scrambling to identify alternative solutions.

Shinn and Richard (2022) assert that there are three central issues to consider in the redesign of how homeless services systems approach the allocation of scarce resources. These include assessment of risk (or who do we consider vulnerable, how do we define vulnerability, and how do we measure it), prioritization (what factors determine who should receive resources first) and matching (what determines who is appropriate for which housing intervention). Continued research on the VI-SPDAT and VI-SPDAT subscales and their association with housing outcomes by race and sub-population have the potential to inform improved tools, approaches, and processes and ensure equitable allocation of scarce housing resources. The hope is that this work will be generative in that it will be shared with the community for consideration as they reflect on how to conceptualize vulnerability for people experiencing homelessness both within the local context and within the systems that have institutionalized White advantage and potentially predisposed persons of color to risk for homelessness. This democratic research model asserts that the scope of this research extends beyond the generation of knowledge itself and is action-oriented with the goal of developing equitable assessment tools that utilize participatory methods (Ansley & Gavena, 1997).

1.2 Purpose of Study

Using data from the Charlotte-Mecklenburg Homeless Management Information System (HMIS), this study aimed to replicate national research within the local context of the Charlotte-Mecklenburg CoC. It extends research conducted by the Center for Social Innovation and Thomas and colleagues (2020) by examining the relationships between

race, program outcomes, and housing prioritization among subpopulations of individuals and families experiencing homelessness using propensity score methods.

Previous studies on this topic have almost exclusively used univariate, bivariate, and regression techniques. This study utilizes propensity score methods described by Ulmer (2012), which allow for the analysis of homelessness service system outcomes and VI-SPDAT data with balanced and comparable samples of persons experiencing homelessness using race as the “exposure”. Propensity score matching has been used to examine race as a treatment variable where a treatment and comparison groups are created based on racial identity (Higgins et al., 2013; Ridgeway, 2006). In the present study, I used propensity score matching to create matched samples of Black or African American individuals and families experiencing homelessness who had a similar distribution of identified features as White individuals and families experiencing homelessness. These methods have the potential to provide a more accurate estimate of the influence of race on study outcomes. To date, no known studies have used this method to examine race effects on VI-SPDAT scores and homeless service system program outcomes.

1.3 Research Questions

This study focused on the following research questions:

1. According to Homeless Management Information System (HMIS) data, are there statistically significant racial differences (Black vs. White) in program outcome (exit to housing/ exit to homelessness)? Does this differ by sub-population status

- (unaccompanied youth age 18-24, veteran, domestic violence survivor, families with children)?
2. According to the Coordinated Entry assessment data, are there racial differences in overall VI-SPDAT scores among persons experiencing homelessness? Does this differ by sub-population status (unaccompanied youth age 18-24, veteran, domestic violence survivor)?
 3. Are their racial differences in VI-SPDAT subscale scores: History of Housing and Homelessness, Risks, Socialization and Daily Function, Wellness? Does this differ by sub-population status (unaccompanied youth age 18-24, veteran, domestic violence survivor)?
 4. What VI-SPDAT subscales predict overall housing need intervention classification? Does this differ by race? Does this differ by sub-population status (unaccompanied youth age 18-24, veteran, domestic violence survivor)?

1.4 Organization of Remaining Chapters

The remaining chapters provide a synopsis of information that is germane to this study. Chapter Two provides an overview of Racial Formation, Systemic Racism, and Vulnerability theories and a review of literature related to race, sub-population membership, homelessness, and the VI-SPDAT. Chapter Three provides an exposition of the research method including the study design, data source, measures, and analyses. Chapter Four provides detailed findings from the analyses by research question. Chapter Five is a discussion of the findings, how they can be interpreted within the lens of existing literature, and implications for practice and future research.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

In Notice CPD-16-11 (2016), the United States Department of Housing and Urban Development (HUD) provided guidance to Continuums of Care (CoCs) and CoC Program funded Permanent Supportive Housing (PSH) providers to ensure that CoC Program resources are used effectively and strategically. This notice suggests that by utilizing a first come, first-served approach to distribution of housing resources, programs will likely screen in individuals who will be successful in housing programs and screen out those individuals who have the highest level of service and resource need. HUD asserts that this approach has been ineffective in reducing the overall number of individuals experiencing chronic homelessness. Instead in CPD-16-11 (2016), HUD suggests that CoCs prioritize individuals with the highest service need for available housing resources and that communities use data driven methods such as standardized assessment tools to determine level of service of need. This guidance in tandem with the broad implementation of coordinated assessment in homeless services systems meant that communities needed assessment tools to evaluate service need or individual vulnerability so they could prioritize housing resources in a clear, transparent, and accurate way. Inaccurate measurement in this case can result in inaccurate prioritization for resources and can negatively impact an individual's ability to access housing resources (Brown & Cummings, 2018). To capture the vulnerability of an individual adequately, a

psychometric instrument must accurately capture their lived experiences (Boateng, Neilands, Frongillo, Melgar-Quinonez, & Young, 2018). Black, Indigenous, Persons of Color (BIPOC) are five times more likely to experience homelessness than Whites (Olivet, 2018). To accurately assess vulnerability among people experiencing homelessness, psychometric instruments must measure latent constructs that demonstrate the impact and experience of systemic racism.

2.2 Theoretical Framework

Extensive research has highlighted that BIPOC are overrepresented in several existing institutions and systems including the criminal justice system and in homelessness services systems (AHAR, 2018; Bonzcar, 2003; Couloute, 2018; Olivet, Dones, & Richar, 2018; Roundtree, Hess, & Lyke, 2019). It is also well-known that BIPOC experience persistent differential outcomes across biological, social, and economic domains such as health, education, and employment (Blank, Dabady, & Citro, 2004). These differential outcomes are largely influenced by socioeconomic disadvantage resulting from spatial inequities caused by segregation and the resulting social ecology (Coulton, Korbin, Su, & Chow, 1995). Such spatial inequities include economic disinvestment in schools and services in communities of color, deprivation of wealth building opportunities via redlining, and decreased access to social capital which may be critical to economic mobility (Bailey et. al., 2017; Green, Turner, & Gourevitch, 2017; Roithmayr, 2004). In addition, the aforementioned systems and domains often implement data collection tools, practices, and policies that lack predictive parity or fail to invest in efforts to ensure that outcomes are equitable. These and other macro-social factors have a

disparate impact on the quality, quantity, and type of systems and resources BIPOC are able to access and their biological, social, and economic outcomes (Chouldechova, 2017). The root cause of these disparities is structural or systemic and epistemic racism which manifests in the policies and practices of institutional systems, systems of care, and white normative standards of experience and behavior (Hawn-Nelson, Jenkins, Zanti, Katz, Berkowitz, et al., 2020). Centering race and vulnerabilities that are a direct result of a structural environment embedded with racism and the resulting social ecology focuses this analysis on the structurally driven inequities that impact racial parity in resource availability and access and housing outcomes among BIPOC experiencing homelessness.

2.3 Racial Formation and Systemic Racism Theories

Racial Formation and Systemic Racism theories assert that ideological and political processes have embedded race categories and White advantage in United States policies and institutions (Feagin, 2013). Race categories are central in “organizing social inequalities of various sorts” (Omi & Winant, 1994, p. vii). United States laws and regulations at the federal, state, and local level have shaped White societal norms, educational, residential, scientific, medical, and occupational segregation, and categorization (Omi & Winant, 1994; Smedley, 1999). This segregation and categorization or discrimination in the social environment has implications for employment, education, housing, income, and health (Lillie-Blanton & Laveist, 1996). A review of the literature on homelessness and race suggests significant differences in vulnerabilities, risk, health, and program outcomes by race and by subpopulation of homelessness, with some research suggesting that racial discrimination coupled with

associated socioeconomic disadvantage may be a primary precursor to homelessness for BIPOC (Jones, 2016; North & Smith, 1994; Carter, 2011).

Education

The 1966 Equality of Educational Opportunity (EEO; Coleman Report) Report was one of the first times the educational achievement gap between Black and White students was documented (Coleman et. al, 1966, Bartz, 2016). The Coleman report suggested that the differences in achievement were more related to family background (household composition, family environment, parental education) than school resource levels (Coleman et. al, 1966, Bartz, 2016). In addition, the report suggested variables of peer influence including attendance, discipline problems, and college preparedness as factors that influenced the quality of education (Coleman et. al, 1966, Bartz, 2016). In addition, the Coleman Report highlighted that the majority of the students attending public schools in the United States attended segregated schools with 65% of Black children in the first grade attending schools that were 90%-100% minority (Coleman et. Al, 1966, Bartz, 2016). A review of 2013 National Assessment of Educational Progress revealed that in the fifty years since the Coleman Report, there has been little progress in narrowing the achievement gap (Hanushek, 2016). The gap in graduation rates between Black and White students continues to persist despite increased overall graduation rates with Black students three times more likely to attend a high school where less than 60% of ninth graders graduate four years later (Amah, 2012). Coupled with these factors, there is disproportionality in the number of disciplinary infractions received by Black students when compared to White students and higher numbers of Black students who are diagnosed with a learning disability (National Association for the Advancement of

Colored People (NAACP), 2005; Jealous, Brock, & Huffman, 2011;; Shifrer, Muller, & Callahan, 2011; Beck & Muschkin, 2012). Both of these factors undoubtedly impact the educational achievement and experiences of Black students. However, not to be ignored is the systematic disinvestment in communities of color which has both historically and contemporaneously impacted the physical, economic, and social infrastructure of communities of color (Lipman, 2013). This disinvestment in infrastructure influences the equitable allocation of resources for public education with Black schools often notably underfunded compared to White schools (Baker 2016; Carruthers and Wanamaker 2013; Lipman, 2013). Contrary to what was previously found by Coleman and colleagues (1966), more recent research has suggested that there is in fact a link between school spending, school quality, and student level outcomes (Hardy, Logan, & Parman, 2018; Jackson, Johnson, & Persico 2016; Lafortune, Rothstein, & Schanzenbach, 2018) These disparate educational experiences impact opportunities for economic success in adulthood including future income potential and likelihood of economic mobility; both of which ultimately influence housing outcomes and housing stability among people who identify as Black.

Criminal Justice

According to the Sentencing Project (2017), more than 60% of the two million people currently incarcerated are persons of color. Black men and Black women are six times more likely to be incarcerated than White men and women (Bonczar, 2003). These disparities can be linked to the targeting, policing, criminalization, and confinement of Black Americans, practices which have been omnipresent since the inception of modern policing (Hinton & Cook, 2021). Incarceration has implications for an individual's ability

to gain employment and obtain a livable wage. People who have been incarcerated may experience decreased human and social capital (Western, 2002). Employers are less likely to hire ex-offenders and some convictions may disqualify an individual from a particular type of job (Holzer, 1996; Love & Kuzma, 1996; Schwartz & Skolnick, 1962). Incarceration is associated with erosion of job skills and social networks that may facilitate an individual's connection to stable employment opportunities (Hagan, 1993; Kling, 1999). A review of literature linking arrest records to unemployment records suggests that imprisonment is associated with an earnings loss between 10% and 30% (Grogger, 1995; Kling, 1999; Lott, 1990; Waldfogel, 199a; Western, 2002). In addition, people who have been incarcerated are 13 times more likely to experience homelessness than the general public and people experiencing unsheltered homelessness are more likely to interact with the criminal justice system than those experiencing sheltered homelessness (Couloute, 2018; Roundtree, Hess, & Lyke, 2019). Disconnection from social supports, low wages and wage growth, and job and housing discrimination increase the likelihood that persons who have been incarcerated will experience homelessness (Couloute, 2018; Gillespie & Batko, 2020). Likewise, people who are homeless are more likely to interact with the criminal justice system (Gillespie & Batko, 2020; Roundtree, Hess, & Lyke, 2019). Structural racism within criminal justice, employment, housing, and other systems result in an overrepresentation of BIPOC in both criminal justice and homeless services systems (Annual Homelessness Assessment Report, 2018; The Sentencing Project, 2018).

Health

Individuals who are Black are more likely to die at an early age from high blood pressure, diabetes, and stroke compared to their White counterparts with the leading cause of death among Black people being heart disease, cancer, and accidents (Center for Disease Control and Prevention, 2013, 2017). The 2002 Institute of Medicine (IOM) report: *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care* highlights two key factors related to racial disparities in health outcomes: healthcare systems and patient and/or provider level discrimination (Smedley, Stith, Nelson, 2002). Jones (2002) utilizes the framework of institutionalized racism, personally mediated racism, and internalized racism to examine how racism can influence health disparities. Institutionalized racism impacts access to goods, services, and opportunities, including access to health insurance (Jones, 2002; Peek et. al., 2010). In 2019, 10.1% of non-Hispanic Black individuals were uninsured compared to 6.3% of non-Hispanic White individuals; 55.9% of non-Hispanic Black individuals used private health insurance, compared to 74.7% of non-Hispanic White individuals, and 43.5% of non-Hispanic Black individuals utilized Medicaid or public health insurance compared to 34.3% of non-Hispanic White individuals (Office of Minority Health Resource Center, 2019). Further, an analysis of Medicaid outcomes by race and ethnicity found that while Medicaid did increase access to care, decrease out-of-pocket costs, and decrease psychological distress, disparities by race and ethnicity were still present, suggesting Medicaid alone cannot eliminate the disparities in outcomes and access (Winkelman, Segal, & Davis, 2019). Personally mediated racism is prejudice or assumptions based on race and discrimination or differential actions based on race (Jones, 2002; Peek et. al., 2010). Personally mediated

racism can manifest as how a provider interacts or communicates with a person seeking or receiving services which can influence interpretation of symptoms and clinical decision-making (Burgess, Van Ryn, Dovidio, Saha, 2007; Finnucane & Carresse, 1990; Peek et. al., 2010). Internalized racism is the acceptance of negative messaging about stigmatized races by the individual receiving or providing care (Jones, 2002; Peek et. al., 2010). This may impact how an individual communicates with the provider or patient and the patient's ability to engage in decision-making and conversation related to their condition or care (Peek et. al., 2010).

Individuals experiencing homelessness for a prolonged period of time have mortality rates three to four times that of the general population (Henwood, Byrne, Scriber, 2015; Hibbs et. al., 1994; O'Connell, 2016). One longitudinal study of newly homeless persons to the New York shelter system examined individual health status at shelter entry and found that 60% of the people who stayed in the study for 18 months reported at least one health issue with 6% reporting diabetes, 17% reporting hypertension, 17% reporting asthma, 35% reporting major depression, and 53% reporting substance use disorder (Schanzer, Dominguez, Shrout, & Caton, 2007). Two-thirds of the sample were Black or African American. For those who were still homeless at 18 months, there were increased rates of reporting across all five disease types (Schanzer, Dominguez, Shrout, & Caton, 2007). These data suggest that individuals who entered homelessness for the first time had disease rates higher than the prevalence in the general population and that prolonged experience of homelessness was related to increased incidence of disease.

Housing

During the first part of the 20th century, the two prominent mechanisms for racial control and segregation were zoning and restrictive covenants which limited access to housing opportunities for persons of color (McGrew, 1997). The Federal government endorsed and supported residential segregation by requiring racially restrictive covenants and prescribing neighborhood racial composition as a condition of receiving Federal Housing Assistance (FHA; Lief & Goering, 1987). In addition, the Homeowners Loan Corporation, a federal agency, developed maps that documented the relative risk for lending across neighborhoods (Aaronson, Hartley, & Mazumber, 2018). Relative risk was determined by a number of housing related characteristics and non-housing related characteristics such as the racial and ethnic composition of the neighborhoods (Aaronson, Hartley, & Mazumber, 2018).

The lowest rated neighborhoods were those with the highest number of Black and African American residents and were drawn in red on the maps (Aaronson, Hartley, & Mazumber, 2018). Neighborhoods that appeared in red or those that were “red-lined” were neighborhoods where borrowers were refused credit and mortgage insurance and were typically the only place Black and African American persons could access housing due to zoning and restrictive covenants (Aaronson, Hartley, & Mazumber, 2017; McGrew, 1997). These practices, which were widely adopted by mortgage lenders, constrained the availability of stable, affordable, and safe housing stock available to Black and African American people and prohibited their access to home ownership and thus their ability to accumulate wealth via home ownership (Leigh & Stewart, 1992; Massey & Denton, 1993; McGrew, 1997; Swope & Hernandez, 2019). For those who

were able to purchase homes despite these constraints, the homes were geographically segregated, appreciated at lower rates than homes bought by White homeowners, and produced less housing wealth gained over time than homes purchased by White homeowners (Coulton, personal communication, March 20, 2023).

Today, Black and African American people continue to face barriers to safe, decent, and affordable housing via reverse redlining such as increased likelihood of receiving toxic or high-cost sub-prime mortgage loans (Coulton, Chan, Schramm, & Mikelbank, 2008). Other barriers include source of income discrimination, housing choice voucher discrimination, racial discrimination by landlords or brokers, and gentrification, which result in continued racial segregation and relegation to housing in high-poverty neighborhoods with low quality housing (Aratani, Lazzeroni, Brooks-Gunn, & Hernandez, 2018; Beeman, Silfen Glasberg, & Casey, 2011; DeLuca, Garboden, & Rosenblatt, 2013; Hwang & Lin, 2016; Turner, Santos, Levy, & Wissoker, 2013). These factors influence residential stability and an individual's ability to access and maintain safe, decent, and affordable housing.

2.4 Theory of Vulnerability

Vulnerability Theory also informs this study by providing a framework through which to conceptualize vulnerability. It posits that community and individual attributes and social exposures like racism predict poor physical, psychological, and social outcomes (Aday, 1994). Resource access and availability is influenced by social status such as age, gender, race, and ethnicity and thus also potentially influenced by structural racism (Lucey, 2007). Availability and access to community resources significantly

impacts an individual's relative risk for poor health (Aday, 2001). Resource access and availability is further influenced by structural racism that not only impacts access and availability to resources and resource quality but also potentially elevates relative risk related to lifestyle, behaviors, choices, health, and social outcomes like homelessness (Gee & Ford, 2011). Aday (1994) asserts that "vulnerable populations are at risk of poor physical, psychological, and social health" (p.1). Such attributes and exposures increase the relative risk for poor health outcomes and likewise may increase the risk for poor social outcomes such as homelessness. HUD recommends that CoCs prioritize their housing resources for those who are most vulnerable. For the purposes of this study, vulnerability is defined as the cumulative risk for the worst physical, psychological, and social outcomes if the individual is not prioritized for a housing resource. Together, these theories help us to better understand the influence of systemic racism on differential individual and group vulnerability and housing status. Figure 2.1 shows the combined theories and how they can be applied to better understand housing outcomes among people who are Black or African American and experiencing homelessness. If as suggested by the proposed conceptual model, Black and African American individuals should have higher vulnerability due to the interactions of a structural environment embedded with racism, relative risk, and resource availability, then we should expect to see Black or African American individuals score higher on the VI-SPDAT.

2.5 Conceptual Model

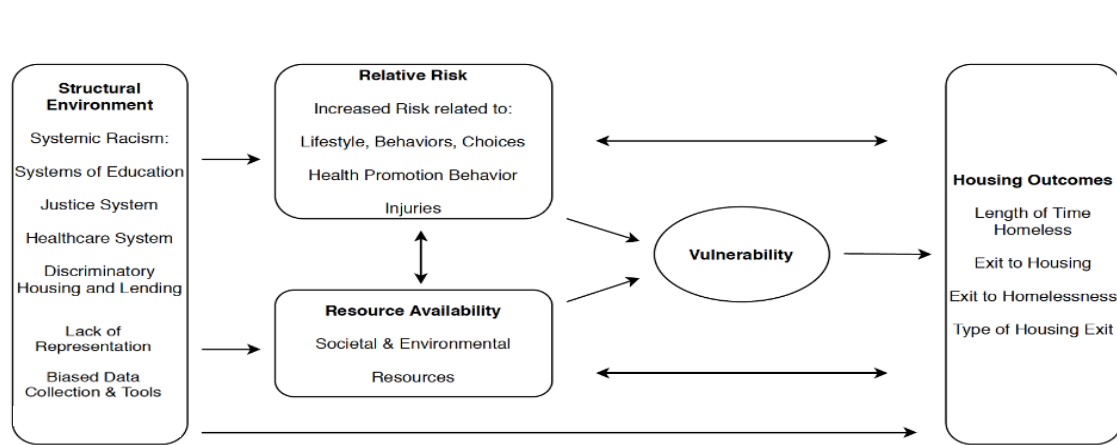


Figure 2.1 The Impact of Structural Racism on Vulnerability and Housing Outcomes

The conceptual model for this study provides an overview of the hypothesized influence of structural racism on both vulnerability and housing and consists of five key concepts: structural environment, relative risk, resource availability, vulnerability, and housing outcomes. Structural environment is a proxy for systemic and epistemic racism. It refers to the immediate social, cultural, and physical environment in which people live. For Black people in particular, the structural environment has been constructed through centuries of policies and practices that have institutionalized White advantage and White norms in healthcare, justice, and education. This has resulted in discriminatory social and economic practices including the use of biased data collection tools that are normed on the White experience. Relative risk is the ratio of risk of poor outcomes among groups that are exposed to risk factors compared to those who are not. This model suggests that for Black people, exposure to a structural environment embedded with racism and White advantage results in increased risk related to lifestyle, behaviors, choices, and health

promotion behavior. Resource availability for Black people is also influenced by a structural environment embedded with racism whether it be decreased access to resources in the built environment due to environmental disinvestment, decreased resource access due to explicit or implicit racism, or decreased access to resources as a result of racist policies and practices that increase engagement with systems that limit resource access such as the criminal system. Further, increased relative risk also has the potential to influence resource availability. Together the structural environment, individual relative risk, and resource availability interact to determine an individual's vulnerability or cumulative risk for the worst physical, psychological, and social outcomes. In the world of homeless services, vulnerability is the metric used to prioritize an individual for a housing resource and thus higher vulnerability scores should result in a quicker exit to a permanent housing situation. Within this model, there are hypothesized relationships. For example, Black people exposed to a racist structural environment that may result in criminal justice, economic, and housing barriers might be less likely to exit to permanent housing situations, one of the phenomena examined in this study. Those who have increased risk for poor outcomes alone or decreased access to resources might also be less likely to exit to permanent housing. The focus of this study is the conceptualization of vulnerability, how it is measured and if the measurement tool demonstrates measurement equivalence by race and across youth, domestic violence survivor, and veteran populations.

2.5 Literature Review

The 2018 Department of Housing and Urban Development (HUD) Annual Homelessness Assessment Report (AHAR) to Congress estimated that 1,446,000 individuals experienced sheltered homelessness in the United States. Of the close to 1.5 million experiencing homelessness, 18% reported chronic patterns of homelessness, 106,000 were veterans, 501,000 were individuals who were part of nearly 156,000 families with children, 113,330 were unaccompanied youth, 28% were survivors of domestic violence, and 10% were currently fleeing abusive situations (AHAR, 2018). Black or African American persons accounted for 43% of the heads of household despite only representing 13% of the heads of household and 22% of heads of households living in poverty in the United States (AHAR, 2018).

HUD developed the coordinated entry process to ensure that all people experiencing a housing crisis had fair and equal access to be assessed, referred, and connected to housing assistance based on their strengths and needs (HUD, 2015). HUD asks communities to operate person-centered coordinated entry systems that “prioritize people who are most in need of assistance” and to “strategically allocate their current resources and identify the need for additional resources” (HUD, 2017, p. 8). As such, Continuums of Care (CoCs) have adopted common assessment prioritization tools that facilitate their ability to identify those most in need of assistance to ensure those most in need receive priority access to any housing and homeless assistance available in the CoC (HUD, 2015). One such tool that has been widely adopted for use in prioritization is the Vulnerability Index-Service Prioritization Decision Assistance Tool (VI-SPDAT).

VI-SPDAT

The VI-SPDAT combines two pre-existing tools: the Vulnerability Index which measures medical vulnerability and the Service Prioritization Decision Assistance Tool which assesses socio-economic and psychosocial risk factors related to homelessness to determine case management need and type of housing intervention (McCauley & Reid, 2020; King, 2018). The 2015 VI-SPDAT product line consists of three versions: VI-SPDAT V 2.0 for Individuals which is conducted with single adults, the VI-SPDAT V 2.0 for Families which is conducted with families with minor children, and the VI-SPDAT 1.0 for Youth which is conducted with unaccompanied transitioning age youth ages 18-24 (Orgcode, 2015). This study focuses on the VI-SPDAT V 2.0 for Individuals and the VI-SPDAT V 2.0 for Families. The VI-SPDAT V 2.0 for Individuals consists of four domains: History of Housing and Homelessness, Risks, Socialization and Daily Function, and Wellness (Orgcode, 2015). The VI-SPDAT V 2.0 for Families consists of five domains: History of Housing and Homelessness, Risks, Socialization and Daily Function, Wellness, and Family Unit (Orgcode, 2015). There has been limited research on the reliability and validity of the VI-SPDAT (Brown et. al, 2018; King, 2018). Extant research suggests that the VI-SPDAT has poor test-retest reliability, poor inter-rater reliability, prevalence of underreporting or overreporting of vulnerability, provider, and stakeholder concerns about whether the tool accurately measures vulnerability, and racial, ethnic, and gender disparities in overall, subscale, and item responses (Brown et. al, 2018; Cronley, 2020; King, 2018; Salim, 2020; Thomas et. al., 2020; Wilkey et. al., 2019). Two of these studies found that Whites are more likely to receive a higher VI-SPDAT prioritization score when compared to their BIPOC counterparts, however, it is

important to note that both of these studies focused specifically on persons experiencing chronic homelessness (Wilkey et. al., 2019; Thomas et. al., 2020). Previously, the Charlotte-Mecklenburg CoC only conducted the VI-SPDAT with individuals and families who were experiencing chronic homelessness. In order to prioritize all permanent housing resources (instead of just permanent supportive housing which requires chronic homelessness), the VI-SPDAT is now administered to all individuals and families experiencing homelessness. This change has created a local need to better understand variation in VI-SPDAT total and subscale scores regardless of chronic status.

While there have been studies that examine the reliability of the VI-SPDAT, this study focuses on validity. If the VI-SPDAT lacks measurement validity then it either does not measure the construct it is believed to measure or it is not robust enough to cover all or most of the dimensions of the construct across groups (Perron & Gillispie, 2015). Reliability is irrelevant if the tool lacks validity. It is important to note that this study does not employ psychometric testing but other studies have (See Brown et al., 2018). Instead, this study examines group variability across the overall VI-SPDAT and its' subscales to inform future approaches and tools to measure vulnerability as conceptualized in this study.

Sub-populations

Veterans are overrepresented in the homeless population accounting for almost 13% of homelessness in 2018 (HUD, 2020). They may experience unique risk factors associated with combat-related and military sexual trauma, geographic displacement, family and relationship conflicts, mental health and substance use disorders, incarceration, and disrupted social networks (Tsai & Rosenheck, 2015; Perl, 2015).

Likewise, families with children, survivors of domestic violence, and unaccompanied youth experience homelessness at a high prevalence (HUD, 2020). Each of these groups have unique risk factors that impact not only their current but also long-term vulnerability (Fritsch, Hiler, Mueller, Wu, & Wustman, 2017; Thomas, Messing, Ward-Lasher, & Bones, 2020; McCauley & Reid, 2020; Curry, Morton, Matjasko, Dworsky, Samuels, & Schlueter, 2017; Morton, Dworsky, Matjasko, Curry, Schlueter, Chávez, & Farrell, 2018; Hatsu et. al., 2019; Guarino, Rubin, & Bassuk, 2007; Rodriguez, Shinn, Lery, Haight, Cunningham, & Pergamit, 2020). Among these sub-populations, there is also variation by race in incarceration, satisfaction with healthcare, impact of case management, risk, and health risk behaviors (See Jones, 2016). Given the large variation in types of vulnerabilities and potential for long-term vulnerability, research on how these sub-populations score on the VI-SPDAT prioritization tool, subscales, and items, and how sub-population membership impacts program outcomes is needed.

Thomas and colleagues (2020) published findings from the Housing First Charlotte-Mecklenburg Evaluation Study. In addition to examining project and initiative outcomes, the study also examined data from 1660 individuals who were on the community's chronic homelessness by-name list during 2015-2018 using HMIS data. Univariate and bivariate analysis including Chi-square and t-tests analyses were utilized to examine VI-SPDAT scores by gender, race, age, ethnicity, and veteran status. The study found that the distribution of scores was similar by gender (male, female) and age (<50 years old, >50 years old). The analysis by race found that only 21% of BIPOC scored in the 12+ range compared to 36% of Whites. Forty-five percent of BIPOC scored in the score range associated with the permanent supportive housing intervention

classification compared to 60% Whites. Further, BIPOC scores were on average 1.1 points lower than White Individuals. These findings suggest that on average, the VI-SPDAT scores White individuals higher than BIPOC individuals in the Charlotte-Mecklenburg CoC and are consistent by findings from Wilkey et al., 2019.

The literature examining the VI-SPDAT and homeless services program outcomes by race is extremely limited. Brown and colleagues (2018) examined VI-SPDAT reliability and validity but did not include race as a unit of analysis. Salim (2020) replicated Brown and colleagues work to examine reliability and validity and included race and gender as covariates. However, the sample was small which limited the power of the analyses and only included individuals who had experienced chronic homelessness which limits generalizability. Cronley (2020) examined if gender and race moderated the relationship between trauma and VI-SPDAT total score using bi-variate and moderated path analysis. The study used an unbalanced sample (70% White) which is associated with increased likelihood of type I error. Further bi-variate analysis can only be used to consider two variables at a time but similar to path analysis cannot be used to examine cause and effect. King (2018) utilized confirmatory factor analysis and did identify weak invariance but their study examined a previous version of the VI-SPDAT (version 1) which has since been retired. Wilkey et. al (2019) used bi-variate and multivariate analysis to examine racial differences in overall and VI-SPDAT subscale scores and housing need intervention classification but their study focused on a Pacific Northwest sample.

The current study builds upon the aforementioned findings by evaluating a larger, local data set using a matched sample created via propensity score matching. Propensity

score matching has been used to address selection bias in quasi-experimental design by allowing researchers to create treatment and comparison groups based on the likelihood that group members will possess identified characteristics (Higgins, Ricketts, Griffith, & Jirard, 2013). Several studies, particularly in the criminal justice arena, have used propensity score matching to examine race as a treatment variable to balance covariates that might be impacted by race (Higgins et al., 2013; Ridgeway, 2006;). These methods have the potential to provide a more accurate estimate of the influence of race on study outcomes. In addition, this study builds on previous research by employing more advanced statistical techniques and not only examining the relationship between race and program outcomes, and race and VI-SPDAT scores but also how this relationship varies by sub-population, within sub-scales of the VI-SPDAT tool, and in relation to housing need intervention classification.

Given these factors, this research study had three aims: (1) extend existing research by conducting a race equity analysis of VI-SPDAT data both overall and by sub-population; (2) provide a race equity analysis of housing outcomes; and (3) utilize propensity score matching to examine the relationship between race, program outcomes, and housing prioritization among sub-populations of people experiencing homelessness.

CHAPTER 3

METHOD

3.1 Study Design

The method used for this study is secondary data analysis of County level administrative data from the Homeless Management Information System (HMIS). The data in this project were acquired from the HMIS Lead agency for the county-wide homeless services Continuum of Care. These data were collected by local homeless services, housing, and homelessness prevention providers for program administration, federal, state, and local funding requirements, and local and CoC wide system performance and outcome measurement.

This study utilized deidentified client-level Homeless Management Information System (HMIS) data collected from January 1, 2016 – December 31, 2021, for the Charlotte-Mecklenburg Continuum of Care (CoC). The CoC geographic area is one county and consists of a large urban city and eight surrounding rural and suburban townships. The CoC is the largest in the state and has a population of over a million people (U.S. Census Bureau, [2018](#)). The county is 47% White, 31% Black-African American and 13% Hispanic-Latino. (U.S Census Bureau, 2018). The median area income is \$64, 312 and the poverty rate is 13% which is lower than the state average.

3.2 Overview of Homeless Management Information System Data

HMIS is a federally mandated local information technology and data collection system used to collect and store client level data on the characteristics, needs, and provision of homeless assistance programs to individuals and families experiencing homelessness or at-risk of homelessness. In 2009, the Homeless Emergency Assistance and Rapid Transition to Housing (HEARTH) Act required HMIS participation for recipients and subrecipients of Continuum of Care (CoC) Program and Emergency Solutions Grants (ESG) funds. (Federal Register Vol. 77 No. 147). Deidentified client level data from the Charlotte-Mecklenburg HMIS system were used to examine racial and sub-population differences in homeless services program outcome, (RQ1) VI-SPDAT overall score (RQ2), VI-SPDAT subscale score, (RQ3) and the relationship between VI-SPDAT subscale scores and housing need intervention classification (RQ4).

3.3 Vulnerability Index-Service Prioritization Decision Assistance Tool 2.0 (VI-SPDAT 2.0)

The Vulnerability Index-Service Prioritization Decision Assistance Tool 2.0 (VI-SPDAT 2.0) is a housing prioritization tool that is widely used by homeless and housing CoCs to prioritize those with the highest vulnerability and the greatest service need for available housing resources with higher scores indicating higher vulnerability. The tool combines two pre-existing tools: the Vulnerability Index which measures medical vulnerability and the Service Prioritization Decision Assistance Tool which assesses socio-economic and psychosocial risk factors related to homelessness to determine case management need and type of housing intervention (McCauley & Reid, 2020; King,

2018). The 2015 VI-SPDAT product line consists of three versions: VI-SPDAT V 2.0 for Individuals which is conducted with single adults, the VI-SPDAT V 2.0 for Families which is conducted with families with minor children, and the VI-SPDAT 1.0 for Youth which is conducted with unaccompanied transitioning age youth ages 18-24 (Orgcode, 2015). This study will focus on the VI-SPDAT V 2.0 for Individuals and the VI-SPDAT V 2.0 for Families.

The VI-SPDAT V 2.0 for Individuals is administered to those who present as single adults with no children. The tool consists of a pre-survey and four domains. For complete tool and scoring, see Appendix A. The four domains of the tool are: History of Housing and Homelessness, Risks, Socialization and Daily Function, and Wellness and consists of 27 questions (Orgcode, 2015). The History of Housing and Homelessness consists of three questions that seek to establish if the individual has the length of time, frequency of homelessness, and living situation that would meet the living situation and timing requirements for them to be considered chronically homeless. The Risks subscale consists of six questions that evaluate emergency services use interactions, risk for harm, legal issues, and risk for exploitation. The Socializing and Daily Functioning subscale evaluates money management such as owing money or receiving money; meaningful daily activity, such as feeling happy or fulfilled; self-care such as basic needs and toileting; and social relationships as they may be related to homelessness, abuse, or eviction. The Wellness subscale evaluates physical health such as chronic health issues, physical disabilities and healthcare access; substance use such as negative consequences related to housing as a result of substance use, mental health such as developmental or learning disabilities or mental health challenges that impact one's ability to live

independently; tri-morbidity: the presence of physical health, substance use, and mental health challenges; medication management and adherence; and abuse and trauma and its subsequent impact on the current period of homelessness. The total overall score point value is associated with a recommended housing intervention based on the assessed need. The recommendation for persons scoring a 0-3 on the scale is no housing intervention. An assessment for Rapid Rehousing is recommended for those receiving a score between 4-7. An assessment for Permanent Supportive Housing is recommended for individuals who score and eight or higher on the scale. Due to scarce resources, the local CoC has set different thresholds than what are recommended by the scale developers. Locally individuals who score a 12 or higher are recommended for Permanent Supportive Housing while those who score a 10 or 11 are recommended for Rapid Rehousing.

The VI-SPDAT V 2.0 for Families is administered to families who have minor children in the household. It consists of a pre-survey five domains: History of Housing and Homelessness, Risks, Socialization and Daily Function, Wellness, and Family Unit (Orgcode, 2015). For complete tool and scoring, see Appendix B. The History of Housing and Homelessness, Risks, Socialization and Daily Function, and Wellness domains align with the VI-SPDAT for Individuals except that instead of being asked about one person's experience, the family questions are phrased to ask if the individual or anyone in their family has experienced the items asked. The pre-survey for the VI-SPDAT for Families not only asks if there is any one in the household older than age of 60 but also collects information on family size including how many children are in the household or will join the household once housing is obtained and if any member of the family is currently pregnant. The Family Unit subscale of the tool asks the individual

about family legal issues such as having a child removed from the home by Child Protective Services in the previous 180 days or if there are family legal issues that need to be resolved in court and may impact housing or who is able to live in the household and about the needs of children such as child trauma or abuse, whether a child has had to live with family or friends in the previous 180 days due to the respondent's homelessness or if there are school-aged children in the household that attend school more often than not each week. The Family Unit subscale also asks about family stability such as if there has been change in family membership in the past 180 days due to events such as divorce or incarceration and if the individual expects the family unit to change in the 180 days post moving into housing. Finally, the Family Unit subscale evaluates parental engagement. These questions ask about planned outings and activities and the amount of time each day that older children either do not interact with an adult or are the primary caregiver for younger children in the household. The total point possible point value for the VI-SPDAT for Families is 22 points. As with the VI-SPDAT for Individuals, each point value is associated with a recommended housing intervention based on the assessed need. The recommendation for persons scoring a 0-3 on the scale is no housing intervention. An assessment for Rapid Rehousing is recommended for those receiving a score between 4-8. An assessment for Permanent Supportive Housing is recommended for individuals who score nine or higher on the scale. As with the VI-SPDAT for Individuals, due to scarce resources in practice, locally individuals who score a 12 or higher are recommended for Permanent Supportive Housing and those who score a 10 or 11 are recommended for Rapid Rehousing or Permanent Supportive Housing. Those who score 10 or less are typically not prioritized for resources due to resource scarcity.

3.4 Study Sample

The overall HMIS sample size used to answer the research questions consisted of 39,456 unduplicated individuals. All children aged 17 years or younger were removed from the data set. Missing data on key variables were removed using listwise deletion. The sample was limited to only individuals who were homeless (reported literal homelessness or homelessness due to fleeing domestic violence) and heads of household ($n = 13,937$). From this sample, three subsamples were created: an overall sample including both heads of households of families with minor children and individuals with complete data on the program outcome variable: program exit destination ($n = 11,492$), a VI-SPDAT Individuals subsample that was limited to only single individuals who had complete data on the VI-SPDAT 2.0 for Individuals ($n = 3,486$), and a VI-SPDAT Families subsample which included only heads of household of families with minor children who had complete data on the VI-SPDAT 2.0 for Families ($n = 555$). These samples were used to conduct propensity score matching to create matched samples. For a complete overview of sample data management, see Figure 3.1. A full description of the samples both pre and post propensity score matching is provided in Chapter 4.

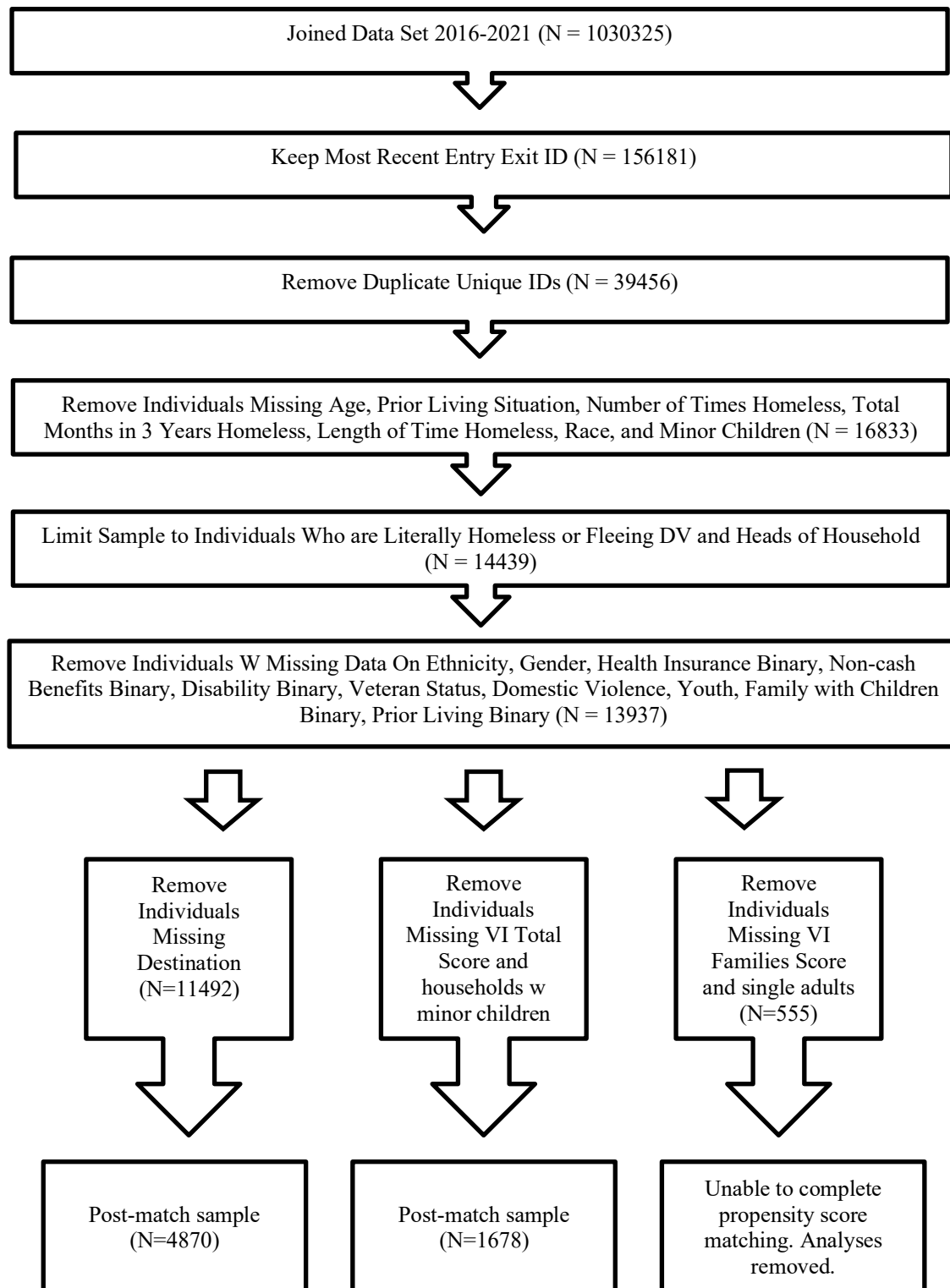


Figure 3.1 Data Management

3.5 Variables

Outcome Variables

Program Outcome.

The primary outcome of homeless services programs analyzed in this study is exit destination. The exit destination is the destination an individual goes when they leave a homeless services program. The exit destination can be classified into four categories: permanent destination, temporary destination, institutional destination, and other. The four categories align with the HUD HMIS Data Standards.

Permanent destinations include: Moved from one Housing Opportunities for Persons with AIDs (HOPWA) funded project to HOPWA PH; Owned by client, no ongoing subsidy; Owned by client with ongoing housing subsidy; Rental by client, no ongoing subsidy; Rental by client with Rapid Rehousing (RRH) or equivalent subsidy; Rental by client with Veterans Assistance Supportive Housing (VASH) subsidy; Rental by client with Grant per Diem Transition in Place (GPD TIP) subsidy; Rental by client with other ongoing subsidy; Permanent Housing (other than RRH) for formerly homeless persons; Staying or Living with Family, permanent tenure; and Staying or Living with Friends, permanent tenure.

Temporary destinations include Emergency Shelter, including hotel or motel paid for with emergency shelter voucher, Hotel or motel paid for without emergency shelter voucher, Safe Haven, Transitional Housing for homeless persons (including homeless youth), Moved from one HOPWA funded project to HOPWA TH, Staying or Living with Family, temporary tenure, Staying or Living with Friends, temporary tenure, and Place Not Meant for Human Habitation.

Institutional destinations include Foster Care Home or Foster Care Group Home, Psychiatric hospital or other psychiatric facility, Substance abuse facility or detox center, Hospital or other non-residential non-psychiatric medical facility, Jail, prison, or juvenile detention center, Residential project or halfway house with no homeless criteria, and Long-term Care Facility or Nursing Home.

Other destinations include Deceased, Other (not otherwise listed in the other exit destination types), Client Doesn't Know, Client Refused, Worker Unable to Determine, and Data Not Collected.

For the purpose of this study a destination category variable was created, and all destinations were coded as Permanent, Temporary, Institutional, or Other.

3.6 VI-SPDAT Individual and Family Overall Scores.

The overall VI-SPDAT score is the total number of points received on the VI-SPDAT Individual and VI-SPDAT Family tools. The VI-SPDAT Individual overall score ranges from 0-17. The VI-SPDAT family overall score ranges from 0-22.

VI-SPDAT Subscales.

In addition to the overall score the VI-SPDAT Individual and Family tools each have subscale score associated with each domain of the tool. For the VI-SPDAT Individual, these domains include: History of Housing and Homelessness (two possible points), Risks (four possible points), Socialization and Daily Function (four possible points), and Wellness (six possible points). The VI-SPDAT Family tool has the same domain as the Individual tool plus one additional domain: Family Unit (four possible

points). Each tool also has a scored pre-survey which was not included as part of the subscale analysis.

For the purpose of this study, subscale scores were treated as both an outcome and a predictor variable.

3.7 Housing Intervention Classification

The VI-SPDAT tools recommend three housing intervention classifications based on tool score (no housing intervention, 0-3, assessment for rapid rehousing, 4-7, and permanent supportive housing/housing first, 8+). However, the Charlotte-Mecklenburg Continuum of Care practically specifies that are four housing intervention classification types. Individuals/families that have a total tool score of 0-4 are typically recommended for a mainstream affordable housing intervention (OrgCode, 2015; Thomas et. al, 2020). Scores 5-9 are recommended for rapid rehousing. Scores 10-11 are recommended for either rapid rehousing or permanent supportive housing and scores 12+ are recommended for permanent supportive housing (Thomas et. al., 2020). To ensure mutually exclusivity in outcomes, for the purpose of this study housing intervention classification was coded as follows (0-4, mainstream affordable housing; 4-11, rapid rehousing; 12+, permanent supportive housing).

3.8 Predictor Variables

Race.

American Indian or Alaska Native, Asian, Native Hawaiian or Other Pacific Islander, Black or African American, and White were included in the data set. However,

due to low cell counts in the Alaska Native, Asian, and Native Hawaiian or Other Pacific Islander categories, the analysis was constrained to comparing the Black or African American and White categories. A binary race variable was created in which Black or African American was coded as 1 and White was coded as 0.

Veteran Status.

Per HUD HMIS Data Standards (2020), a veteran is a person who is older than age 18 and has ever been on active duty in the armed forces of the United States or who was disabled in the line of duty during a period of active-duty training or who was disabled from an injury incurred in the line of duty or from acute myocardial infarction, a cardiac arrest, or a cerebrovascular accident during a period of inactive duty training. A person was categorized as a veteran if they respond ‘Yes’ to any of the above situations. A binary veteran variable was created in which yes to veteran status was coded as 1, and all other responses were coded as 0.

Domestic Violence.

Per HUD HMIS Data Standards (2020), a person is considered a domestic violence (DV) survivor if they report that they have experienced any domestic violence, dating violence, sexual assault, stalking or other dangerous or life-threatening conditions that relate to violence against the individual or a family member, including a child, that has either taken place within the individual's or family's primary nighttime residence. A person was categorized as experiencing domestic violence if they answer ‘Yes’ to any of the above situations. A binary DV variable was created in which yes to any of the described DV situations was coded as 1, and all other responses were coded as 0.

Families with Children.

This variable was calculated and consists of adult heads of household who share a program entry with a child under the age of 18. The Entry Exit Household ID and age variable were used to create variables for number of persons in the household, number of minor children in the household, number of adults in the household, and finally a binary variable for households with minor children in which households with minor children were coded as 1 and families without minor children in the household were 0.

Young Adult.

This variable was calculated and consists of individuals who were heads of their own household age 18-24 years of age. The head of household and age variable were used to identify households that had a head of household who is age 18-24. A binary youth variable was created in which individuals age 18-24 who were heads of their household were classified as youth and coded 1. All other heads of household who did not meet these criteria were coded as 0.

3.9 Covariates

To mitigate potential for bias, propensity score matching relies on the assumption that all necessary covariates have been included. The following covariates were evaluated for inclusion in the propensity score model as they are known factors that influence program outcomes such as length of time homeless and exit to a permanent housing destination. Regression analyses were conducted to examine the covariates relationship with all outcome variables. The following covariates were explored but only covariates with a relationship to the outcome variables were included in the final matching. Primary Race,

Black or African American or White, were used as the “matching” variable within the propensity score process.

1. Age: Client age at entry
2. Ethnicity: Hispanic/Latino, Non-Hispanic/Non-Latino
3. Gender: Male, Female, Gender Non-conforming, Trans Male, Trans Female
4. Chronic Homelessness: Yes, No
5. Relationship to Head of Household
6. Previous Living Situation
7. Length of Time Homeless
8. Number of times in the streets, emergency shelter, transitional housing, or safe haven in the previous three years
9. Number of months in the streets, emergency shelter, transitional housing, or safe haven in the previous three years
10. Disabling Condition: Yes, No
11. Non-cash Benefits from Any Source: Yes, No
12. Covered by Health Insurance: Yes, No
13. Income at Program Entry

3.10 Data Analysis

Propensity Score Matching

A propensity score is the conditional probability that an individual will be a member of a particular group given a specific set of covariates (Rosenbaum & Rubin, 1983). Propensity score approaches can be used to achieve comparability or balance between two groups and control for confounding bias (Ali, Prieto-Alhambra, Lopes, et

al., 2019). Propensity score matching is typically used to address selection bias in quasi-experimental design by allowing researchers to create treatment and comparison groups based on the likelihood that group members will possess identified characteristics (Higgins, Ricketts, Griffith, & Jirard, 2013). Propensity score matching has been used to examine race as a treatment variable to balance study covariates that might be influenced by race (Higgins et al., 2013; Ridgeway, 2006;). When assessing race, propensity score matching can be used to create a treatment group such as in the present study where individuals who identify as Black or African American are the treatment group and a comparison group (individuals who identify as White). Ridgeway (2006) analyzed racial profiling in traffic stops using propensity score matching. This allowed the researcher to create matched samples to examine racial differences in traffic stops using race as the treatment exposure (Ridgeway, 2006). Similarly, the current study used propensity score matching to create matched samples of Black or African American individuals and families experiencing homelessness who had a similar distribution of identified features as White individuals and families experiencing homelessness using race as the treatment exposure. As outlined by Franklin (2015), this approach has several benefits including the ability to examine covariate balance between racial groups by using mean differences; in typical regression, the degree to which control variables are comparable is not directly observable; and propensity score matching does not adhere to the same linear and additive model assumptions as typical regression. Propensity score matching does rely on the assumption that all necessary covariates have been included in the analysis and if such covariates are excluded, there is the potential for biased results (Franklin, 2015; Ridgeway, 2006; Rosenbaum & Rubin, 1983).

To ensure all important covariates were included in the analysis, regression analyses (linear, logistic) were used to identify all covariates that have a relationship with the outcome variables. All covariates that had an association with the outcomes at $p < .10$ were selected for inclusion in the propensity score estimation (Bergstra, Sepriano, Ramiro, & Landewé, 2019; Spreeuwenberg, et al., 2010). Logistic regression and the OneToManyMTCH macro in SAS/STAT were used to create matched data sets (Parsons, 2004; SAS Institute Inc., 2018). First, a new data set was created which excluded the outcome variables and addressed missing values by removing them from the dataset. The propensity score model was fit using logistic regression and used nearest neighbor matching which minimized the matching distance between matches by using a greedy algorithm to select a control unit that has the closest propensity score (Griefer, 2022; Parsons, 2004; Thoemmes and Kim 2011; Zakrisson, Austin, and McCredie 2018). Cases are initially matched to their best control through an initial eight-digit match (Parsons, 2004). Once a match is made, the case is not considered again and the algorithm continues in an iterative process until no additional matches are possible (Parsons, 2004).

After producing the propensity scores, balance diagnostics were conducted to evaluate the balance between the two groups (Black or African American and White). This was done by evaluating the standardized mean differences of covariates and assessing distribution utilizing Chi-square tests for association (Bergstra et al., 2019; Lamm, Thompson, & Yang, 2019). Rubin (2001) suggests that in order for balance to be achieved the following conditions must be met: the difference in means of the propensity scores of the two groups must be small, the ratio of the variances must be close to one,

and the ratios of the residuals of the covariates must be close to one and recommends that standardized differences of means should be less than .25 and the variance of ratios between 0.5 and 2. The matched samples were used to examine differences in program outcomes and vulnerability scores using race as a predictor variable and housing intervention outcomes using race and vulnerability subscale scores and sub-population membership predictor variables.

3.11 Multivariate Analysis

Research Question 1. According to Homeless Management Information System (HMIS) data, are there statistically significant racial differences (Black vs. White) in program outcome (exit to housing/ exit to homelessness)? Does this differ by sub-population status (unaccompanied youth age 18-24, veteran, domestic violence survivor, families with children)?

To assess race as predictor of program outcome (exit to housing/ exit to homelessness), regression models were estimated on the matched samples using race (Black or African American, White) as the independent variable. Each program outcome type (permanent, temporary, institutional, and other) was coded (1 = permanent, 2 = temporary, 3=institutional, 4 = other) and a model was estimated using multinomial regression (with permanent housing as the reference group). To evaluate if these relationships differed based on sub-populations, multinomial logistic regression models were estimated separately including binary sub-population variables: model 1: youth (0,1); model 2: veteran (0,1); model 3: DV survivor (0,1), and model 4: families with

children (0,1). Interaction models were also estimated using an XZ variable where X=race and Z = each sub-population variable.

For all formulas:

Note: Models were run using different Ws where W represents the subpopulation of interests (unaccompanied youth age 18-24, veteran, DV survivor, families with children).

y=predicted value of the dependent variable = outcome

b_0 = intercept of the dependent variable

b_1 = slope

b_2 = slope of interaction

x_1 = independent variable = race

z_1 = interaction variable = race x W

Model 1: Main Effect Model

$$(housing\ status) = b_0 + b_1 * race$$

Models 2-5: Interaction Models

$$(housing\ status) = b_0 + b_1 * race + b_2 * W + b_3 * (race * W)$$

Research Question 2. According to Coordinated Entry assessment data, are there racial differences in overall VI-SPDAT scores among persons experiencing homelessness?

Does this differ by sub-population status (unaccompanied youth age 18-24, veteran, domestic violence survivor)?

To assess race as a predictor of VI-SPDAT prioritization scores, two linear regression models were estimated using (Black or African American, White) as the independent variable. Race was dummy coded (0,1) and the overall score on each prioritization tool

(Individuals, Families) were the dependent variables. To evaluate if these relationships differ based on sub-populations, multinomial logistic regression models were estimated separately including binary sub-population variables: model 1: youth (0,1); model 2: veteran (0,1); and model 3: DV survivor (0,1). Interaction models were also estimated using an XZ variable where X=race and Z = each sub-population variable. These regression models only included individuals with complete data on VI-SPDAT overall scores, race, and sub-population variables.

For all formulas:

Note: Models were run using different Ws where W represents the subpopulation of interests (unaccompanied youth age 18-24, veteran, DV survivor, families with children).

y_1 =predicted value of the dependent variable = VI-SPDAT score Individual

y_2 =predicted value of the dependent variable = VI-SPDAT score Families

b_0 = intercept of the dependent variable

b_1 = slope

b_2 = slope of interaction

x_1 = independent variable = race

z_1 = interaction variable = race x W

Model 1: Main Effect Model: VI-SPDAT Individuals

$$(VI - SPDAT \text{ Individual Score}) = b_0 + b_1 * race$$

Model 2: Main Effect Model: VI-SPDAT Families

$$(VI - SPDAT \text{ Families Score}) = b_0 + b_1 * race$$

Models 3-6: Interaction Models: VI-SPDAT Individuals

$$(VI - SPDAT \text{ Individual Score}) = b_0 + b_1 * race + b_2 * W + b_3 * (race * W)$$

Models 7-10: Interaction Models: VI-SPDAT Families

$$(VI - SPDAT \text{ Families Score}) = b_0 + b_1 * race + b_2 * W + b_3 * (race * W)$$

Research Question 3. According to the Coordinated Entry assessment data, are there racial differences in overall VI-SPDAT scores among persons experiencing homelessness? Does this differ by sub-population status (unaccompanied youth age 18-24, veteran, domestic violence survivor)?

To assess race as a predictor of VI-SPDAT sub-scale scores, linear regression models were estimated using (Black or African American, White) as the independent variable. Race was dummy coded (0,1) and each subscale score on each prioritization tool (Individuals, Families) were the dependent variables. To evaluate if these relationships differ based on sub-populations, linear regression models were estimated separately including binary sub-population variables: model 1: youth (0,1); model 2: veteran (0,1); and model 3: DV survivor (0,1). Interaction models were also estimated using an XZ variable where X=race and Z = each sub-population variable. These regression models only included individuals with complete data on VI-SPDAT overall scores, race, and sub-population variables.

For all formulas:

Note: Models were run using different Ws where W represents the subpopulation of interests (unaccompanied youth age 18-24, veteran, DV survivor, families with children).

y_1 =predicted value of the dependent variable = VI-SPDAT score Individual

y_2 =predicted value of the dependent variable = VI-SPDAT score Families

b_0 = intercept of the dependent variable

b_1 = slope

b_2 = slope of interaction

x_1 = independent variable = race

z_1 = interaction variable = race x W

Model 1-4: Main Effect Model: VI-SPDAT Individuals Subscales

$$(VI - SPDAT \text{ Individuals Subscale Score}) = b_0 + b_1 * race$$

Model 5-10: Main Effect Model: VI-SPDAT Families Subscales

$$(VI - SPDAT \text{ Families Subscale Score}) = b_0 + b_1 * race$$

Models 11-14: Interaction Models: VI-SPDAT Individuals Subscales

$$(VI - SPDAT \text{ Individuals Subscale Score}) = b_0 + b_1 * race + b_2 * W + b_3 * (race * W)$$

Models 12-16: Interaction Models: VI-SPDAT Families Subscales

$$(VI - SPDAT \text{ Families Subscale Score}) = b_0 + b_1 * race + b_2 * W + b_3 * (race * W)$$

Research Question 4. What VI-SPDAT subscales predict overall housing need intervention classification? Does this differ by race? Does this differ by sub-population status (unaccompanied youth age 18-24, veteran, domestic violence survivor)?

To assess VI-SPDAT sub-scale scores as a predictor of housing intervention classification, multinomial logistic regression models were estimated using the VI-SPDAT sub-scale score as the independent variable and housing intervention classification as the dependent variable. Each housing intervention classification type was coded as 1 = 0-4, mainstream affordable housing; 2 = 5-11, rapid rehousing, 3 = 12+

permanent supportive housing. To assess if the relationship between VI-SPDAT sub-scale scores and housing intervention classification differs by race, interaction models were examined. To conduct sub-population analysis, multinomial logistic regression models were estimated separately including binary sub-population variables: model 1: youth (0,1); model 2: veteran (0,1); and model 3: DV survivor (0,1) as covariates in the models. Three-way interaction models were estimated. The regression models only included individuals with complete data on VI-SPDAT overall scores, race, and sub-population variables. Interaction models were also estimated using an XZW variable where X=race, Z = each sub-population variable, and W = VI-SPDAT sub-scale scores. This regression models only included individuals with complete data on VI-SPDAT overall scores, race, and sub-population variables.

For all formulas:

Note: Models will be run using different Ws where W represents the subpopulation of interests (unaccompanied youth age 18-24, veteran, DV survivor, families with children).

Note: Models will be examined separately for each VI-SPDAT subscale where subscale x represents each of the 4 subscales (A, B, C, D)

y_1 =predicted value of the dependent variable = VI-SPDAT Individuals subscale x

y_2 =predicted value of the dependent variable = VI-SPDAT Families subscale x

y_3 =predicted value of the dependent variable = housing intervention

b_0 = intercept of the dependent variable

b_1 = slope

b_2 = slope of interaction 1

b_3 = slope of interaction 2

x_1 = independent variable = race

z_1 = interaction variable = race x W

Models 1-4: Main Effect Model: Subscale Individuals

$$(VI - SPDAT \text{ Individual Subscale } x) = b_0 + b_1 * race$$

Models 5-9: Main Effect Model: Subscale Families

$$(VI - SPDAT \text{ Families Subscale } x) = b_0 + b_1 * race$$

Models 10-13: Main Effect Model: Housing Intervention: Individuals

$$(Housing \text{ Intervention}) = b_0 + b_1 * VI - SPDAT \text{ Individuals Subscale } x$$

Models 13-16: Main Effect Model: Housing Intervention: Families

$$(Housing \text{ Intervention}) = b_0 + b_1 * VI - SPDAT \text{ Families Subscale } x$$

Models 17-32: Interaction Models: VI-SPDAT Individuals

$$(VI - SPDAT \text{ Individual Subscale } x) = b_0 + b_1 * race + b_2 * W + b_3 * (race * W)$$

Models 33-48: Interaction Models: VI-SPDAT Families

$$(VI - SPDAT \text{ Families Subscale } x) = b_0 + b_1 * race + b_2 * W + b_3 * (race * W)$$

Model 49-64: Interaction Models: Housing Intervention, Race, VI-SPDAT

Individuals

$$Housing \text{ Intervention} = b_0 + b_1 * VI - SPDAT \text{ Individuals Subscale } x + b_2 * race + b_3 (VI - SPDAT \text{ Individuals Subscale } x * race)$$

Model 65-81: Interaction Models: Housing Intervention, Race, VI-SPDAT

Families

$$Housing \text{ Intervention} = b_0 + b_1 * VI - SPDAT \text{ Families Subscale } x + b_2 *$$

$$race + b_3 (VI - SPDAT \text{ Families Subscale } x * race)$$

Model 82-97: Interaction Models: Housing Intervention, Race, VI-SPDAT

Individuals

$$\begin{aligned} \text{Housing Intervention} = & b_0 + b_1 * VI - SPDAT \text{ Individuals Subscale } x + b_2 * \\ & race + b_3 (VI - SPDAT \text{ Individuals Subscale } x * race) + b_4 * W + b_5 * \\ & (W * VI - SPDAT \text{ Individuals Subscale } x) + b_6 * (race * W) + b_7 (VI - \\ & SPDAT \text{ Individuals Subscale } x * race * W) \end{aligned}$$

Model 98-113: Interaction Models: Housing Intervention, Race, VI-SPDAT

Families

$$\begin{aligned} \text{Housing Intervention} = & b_0 + b_1 * VI - SPDAT \text{ Families Subscale } x + b_2 * \\ & race + b_3 (VI - SPDAT \text{ Families Subscale } x * race) + b_4 * W + b_5 * (W * \\ & VI - SPDAT \text{ Families Subscale } x) + b_6 * (race * W) + b_7 (VI - \\ & SPDAT \text{ Families Subscale } x * race * W) \end{aligned}$$

CHAPTER 4

PRESENTATION OF FINDINGS

4.1 Propensity Score Matching: Overall Sample

This study examined potential differences in VI-SPDAT total and subscale scores, housing intervention classification, and program outcome among persons experiencing homelessness by race (Black, White). The use of propensity score matching allowed for the creation of two balanced groups of individuals experiencing homelessness, the treatment group (Black individuals) and the control group (White individuals) to better understand the impact of race on VI-SPDAT total and subscale scores, housing intervention classification, and program outcomes. Propensity scores are the conditional probability that given a set of covariates, a person will be in one condition rather than another (Rosenbaum & Rubin, 1983). Propensity scores are calculated by collapsing covariates into a summary score ranging from 0.0 to 1.0 (Cohen, 2005; Kim & Seltzer, 2007; Rubin, 1997). In this study, multivariate logistic regression (SAS PROC LOGISTIC) was used to calculate the predicted probability of the dependent variable (race) and propensity score for each observation in the data set. The scores were then used to match observations to create a 1:1 case-control match on the calculated propensity score using the SAS OneToManyMTCH matching macro (Dehejia & Wahba, 2002; Parsons, 2004; Rosenbaum & Rubin, 1985). The OneToManyMTCH macro employs the nearest neighbor method which matches first using an 8:1 digit match to

identify the closest propensity score matches (Pan, 2015; Parsons, 2004). The macro utilizes a greedy algorithm selecting first the ‘best’ possible match for each case based on the propensity score (Parsons, 2004). Once a control is created, it is not considered again and the macro continues to iterate until no more matches can be made. Once the matching was complete, significance tests were used to evaluate the balance of the covariates between treatment and control groups before and after propensity score matching (see Table 4.1).

Table 4.1*Descriptive Statistics for Treatment and Control Groups, Pre vs. Post-Match*

Group Name	Pre-Match (<i>n</i> = 11492)					Post-Match (<i>n</i> = 4870)				
	Treatment (Black; <i>n</i> = 2436)		Control (White; <i>n</i> = 9056)		<i>p</i>	Treatment (Black; <i>n</i> = 2435)		Control (White; <i>n</i> = 2435)		<i>p</i>
	<i>n</i>	%	<i>n</i>	%		<i>n</i>	%	<i>n</i>	%	
Covariates										
Age										
18-24	875	84.87	156	15.13	<.001	162	50.94	156	49.06	.73
25-54	6396	79.07	1693	20.93	.28	1705	50.18	1693	49.82	.71
>=55	1785	75.25	587	24.75	<.001	568	49.22	586	50.78	.54
Gender					<.001					.33
Male	5040	77.55	1459	22.45		1491	50.56	1458	49.44	
Female	4016	80.43	977	19.57		944	49.14	977	50.86	
Chronically Homeless (Yes)	3462	74.21	1203	25.79	<.001	1186	49.66	1202	50.34	.65
Disability (Yes)	4494	74.20	1563	25.80	<.001	1550	49.81	1562	50.19	.72
Health Insurance (Yes)	4165	80.94	981	19.06	<.001	966	49.61	981	50.39	.66
Income (Yes)	3082	83.36	615	16.64	<.001	594	49.13	615	50.87	.49

Non-cash Benefits (Yes)	3715	81.81	826	18.19	<.001	816	49.70	826	50.30	.76
Months Homeless in 3 Years										
1 month or less	3508	79.60	899	20.40	.10	899	50.00	899	50.00	1.00
2-7 months	2787	80.88	659	19.12	<.001	676	50.64	659	49.36	.59
8-12 months	614	77.72	176	22.28	.44	166	48.54	176	51.46	.57
More than 12 months	2147	75.36	702	24.64	<.001	694	49.75	701	50.25	.82
Number of times homeless in 3 years										
1 time	5038	78.05	1417	21.95	.03	1428	50.21	1416	49.79	.73
2 times	1910	80.86	452	19.14	.01	445	49.61	452	50.39	.80
3 times	825	81.20	191	18.80	.05	185	49.20	191	50.80	.75
4 or more times	1283	77.34	376	22.66	.11	377	50.07	376	49.93	.97
Length of time homeless										
30 days or less	2270	77.45	661	22.55	.04	655	49.77	661	50.23	.85
31-90 days	6786	79.27	1775	20.73	.04	1780	50.08	1774	49.92	.85
91-180 days	5285	79.50	1363	20.50	.03	1388	50.47	1362	49.53	.45
181-271 days	3793	79.20	996	20.80	.38	1003	50.20	995	49.80	.82

272-364 days	2949	79.08	780	20.92	.61	795	50.48	780	49.52	.65
366 -730 days	2344	78.03	660	21.97	.23	664	50.15	660	49.85	.90
731-1096 days	1129	75.82	360	24.18	.003	383	51.55	360	48.45	.36
>=1097 days	642	74.74	217	25.26	.002	232	51.67	217	48.33	.46
Prior Living Situation										
Temporary Situation	2364	79.17	622	20.83	.57	589	48.64	622	51.36	.27
Institutional Situation	358	65.57	188	34.43	<.001	170	47.62	187	52.38	.35
Hotel	604	82.97	124	17.03	.005	107	46.32	124	53.68	.25
Permanent Situation	270	80.84	64	19.16	.36	66	50.77	64	49.23	.86
Place not Meant for Habitation	3895	77.10	1157	22.90	<.001	1226	51.45	1157	48.55	.05
Living with Friends and Family	1565	84.78	281	15.22	<.001	277	49.64	281	50.36	.86

The matched sample was merged with the original data set and all observations without a case control match were removed from the data set. The final data set ($n = 4870$) was used to evaluate research question one. The final matched sample was mostly ages 25-44 years (69.77%), and male (60.55%). Forty-nine percent of the sample met the criteria for chronic homelessness, 6.53% were unaccompanied youth, 9.65% were veterans, and 21.03% reported being survivors of domestic violence. The mean total VI-SPDAT score was 8.52 ($SD = 3.30$). The mean age was 44.48 ($SD = 13.14$) and the mean length of time homeless was 333.45 ($SD = 490.33$). Thirty-six percent exited to a permanent housing destination, three percent exited to an institutional destination, 11% exited to a temporary destination, and 51% exited to a destination of other. See Table 4.2 and 4.3 for full sample characteristics.

Table 4.2*Overall Sample Characteristics After Propensity Score Matching (n = 4870)*

Characteristic	<i>n</i>	%
<i>Ethnicity</i>		
Non-Hispanic/ Non-Latinx	4597	94.39
Hispanic/ Latin	273	5.61
<i>Age Group</i>		
18-24	318	6.53
25-54	3398	69.77
55+	1154	23.70
<i>Gender</i>		
Male	2949	60.55
Female	1921	39.45
Unaccompanied Youth (Yes)	318	6.53
Veteran Status (Yes)	470	9.65
Domestic Violence (Yes)	1024	21.03
Chronic (Yes)	2388	49.03
Disability (Yes)	3112	63.90

Income (Yes)	1209	24.83
Health Insurance (Yes)	1947	39.98
Non-cash Benefits (Yes)	1642	33.72
<i>Program Outcome</i>		
Permanent	1739	35.71
Institutional	151	3.10
Temporary	515	10.57
Other	2465	50.62
<i>Housing Intervention Classification</i>		
Mainstream/ Affordable Housing	146	12.24
Rapid Rehousing	771	64.63
Permanent Supportive Housing	276	23.13

Table 4.3*Group means of VI-SPDAT Domains and Total Score, Age, and Length of Time Homeless Overall and by Race (n = 4870)*

	Population	<i>M</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>
Domain					
History of Housing and Homelessness	Black	1.59	0.57	0.00	2.00
	White	1.55	0.58	0.00	2.00
	Overall	1.57	0.57	0.00	2.00
Risks	Black	1.67	1.26	0.00	4.00
	White	1.92	1.29	0.00	4.00
	Overall	1.80	1.28	0.00	4.00
Socialization and Daily Function	Black	2.390	1.039	0.00	4.00
	White	2.466	0.946	0.00	4.00
	Overall	2.429	0.993	0.00	4.00
Wellness	Black	2.37	1.59	0.00	6.00
	White	2.47	0.99	0.00	6.00

	Overall	2.42	1.00	1.00	6.00
VI-SPDAT total score	Black	8.07	3.20	1.00	15.00
	White	8.96	3.34	1.00	16.00
	Overall	8.52	3.30	1.00	16.00
Length of time homeless	Black	339.33	495.62	0.00	1959.00
	White	327.57	485.02	0.00	1959.00
	Overall	333.45	490.33	0.00	1959.00
Age	Black	44.18	13.07	18.00	89.00
	White	44.77	13.21	18.00	80.00
	Overall	44.48	13.14	18.00	89.00

4.2 Propensity Score Matching: Subsample: Single Individuals

Research questions two through four examined a single individuals subsample of the overall sample and excluded all persons who were heads of households with minor children and did not have complete data on the Individual VI-SPDAT total and subscale scores. To ensure the subsample was also balanced, a copy of the data set was made and all observations without complete data on Individual VI-SPDAT total and subscale scores were removed prior to propensity score matching. Multivariate logistic regression (SAS PROC LOGISTIC) was again used to calculate the predicted probability of the dependent variable (race) and propensity score for each observation in the subsample. As with the overall sample, scores were then used to match observations to create a 1:1 case-control match on the calculated propensity score using the OneToManyMTCH matching macro utilizing the nearest neighbor method (Dehejia & Wahba, 2002; Parsons, 2004; Rosenbaum & Rubin, 1985). Once the subsample matching was complete, significance tests were used to evaluate the balance of the covariates between treatment and control groups before and after propensity score matching (see Table 4.4).

Table 4.4*Descriptive Statistics for Subsample Treatment and Control Groups, Pre vs. Post-Match*

Group Name	Pre-Match (<i>n</i> = 3486)					Post-Match (<i>n</i> = 1678)				
	Treatment (Black; <i>n</i> = 2647)		Control (White; <i>n</i> = 839)		<i>p</i>	Treatment (Black; <i>n</i> = 839)		Control (White; <i>n</i> = 839)		<i>p</i>
	<i>n</i>	%	<i>n</i>	%		<i>n</i>	%	<i>n</i>	%	
Covariates										
Age										
18-24	115	86.47	18	13.53	.004	15	45.45	18	54.55	.60
25-54	1708	75.78	546	24.22	.77	545	49.95	546	50.05	.96
>=55	824	74.98	275	25.02	.37	279	50.36	275	49.64	.84
Chronically Homeless (Yes)	1173	75.58	379	24.42	.66	392	50.84	379	49.16	.52
Disability (Yes)	2031	73.88	718	26.12	<.001	715	49.90	718	50.10	.84
Income (Yes)	1166	80.58	281	19.42	<.001	275	49.46	281	50.54	.76

Non-cash Benefits (Yes)	1247	77.60	360	22.40	.03	352	49.44	360	50.56	.69
Months Homeless in 3 Years										
1 month or less	438	79.06	116	20.94	.06	123	51.46	116	48.54	.63
2-7 months	496	80.91	117	19.09	<.001	117	50.00	117	50.00	1.00
8-12 months	159	76.81	48	23.19	.76	34	41.46	48	58.54	.11
More than 12 months	1554	73.58	558	26.42	<.001	565	50.31	558	49.69	.72
Number of times homeless in 3 years										
1 time	1111	75.02	370	24.98	.28	376	50.40	370	49.60	.77
2 times	469	78.17	131	21.83	.16	112	46.09	131	53.91	.19
3 times	260	76.25	81	23.75	.89	73	47.40	81	52.60	.50
4 or more times	807	75.85	257	24.15	0.94	278	51.96	257	48.04	.27
Length of time homeless										

30 days or less	244	76.73	74	23.27	.73	76	50.67	74	49.33	.86
31-90 days	2403	75.85	765	24.15	.73	763	49.93	765	50.07	.86
91-180 days	2113	75.82	674	24.18	.75	683	50.33	674	49.67	.58
181-271 days	1812	75.41	591	24.59	.28	588	49.87	591	50.13	.87
272-364 days	1624	74.77	548	25.23	.04	534	49.35	548	50.65	.48
366 -730 days	1481	73.98	521	26.02	.002	506	49.27	521	50.73	.45
731-1096 days	958	73.13	352	26.87	.003	370	51.25	352	48.75	.38
>=1097 days	574	73.50	207	26.50	.07	219	51.41	207	48.59	.50
Prior Living Situation										
Temporary Situation	809	77.27	238	22.73	.23	221	48.15	238	51.85	.35
Institutional Situation	108	63.53	62	36.47	<.001	60	49.18	62	50.82	.85
Hotel	63	77.78	18	22.22	.69	16	47.06	18	52.94	.73
Permanent Situation	35	77.78	10	22.22	.77	12	54.55	10	45.45	.67
Place not Meant for	1399	74.97	467	25.03	.16	485	50.95	467	49.05	.36

Habitation

Living with Friends and	233	84.12	44	15.88	<.001	45	50.56	44	49.44	.91
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Family

The matched single individuals subsample was merged with the original single individuals data set and all observations without a case control match were removed from the data set. The final subsample data set ($n = 1678$) was used to evaluate research question two through four. The final matched single individuals subsample was mostly non-Hispanic/non-Latinx (95.47%), ages 25-44 years (65.02%), and male (71.57%). Forty-five percent met the criteria for chronic homelessness, 1.97% were unaccompanied youth, 9.07% were veterans, and 19.73% reported domestic violence. Twenty-six percent exited homelessness to a permanent destination, 16% to an institutional destination, five percent exited to a temporary situation, and 54% exited to an other destination. The mean total VI-SPDAT score was 9.18 ($SD = 3.42$). The mean age was 48.76 ($SD = 12.00$) and the mean length of time homeless was 723.68 ($SD = 647.48$). See full subsample characteristics in Table 4.5 and 4.6.

Table 4.5*Subsample Characteristics After Propensity Score Matching (n = 1678)*

Characteristic	n	%
<i>Ethnicity</i>		
Non-Hispanic/ Non-Latinx	1602	95.47
Hispanic/ Latinx	76	4.53
<i>Age Group</i>		
18-24	33	1.97
25-54	1091	65.02
55+	554	33.02
<i>Gender</i>		
Male	1201	71.57
Female	477	28.43
Unaccompanied Youth (Yes)	33	1.97
Veteran Status (Yes)	152	9.06
Domestic Violence (Yes)	331	19.73
Chronic (Yes)	771	45.95
Disability (Yes)	1433	85.40

Income (Yes)	556	33.13
Health Insurance (Yes)	687	40.94
Non-cash Benefits (Yes)	712	42.43
<i>Program Outcome</i>		
Permanent	309	25.94
Institutional	189	15.87
Temporary	53	4.45
Other	640	53.74
<i>Housing Intervention Classification</i>		
Mainstream/ Affordable Housing	165	9.83
Rapid Rehousing	990	59.00
Permanent Supportive Housing	523	31.17

Table 4.6

Single Individuals Subsample: Group means of VI-SPDAT Domains and Total Score, Age, and Length of Time Homeless Overall and by Race (n = 1678)

	Population	<i>M</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>
Domain					
History of housing and homelessness	Black	1.61	0.56	0.00	2.00
	White	1.57	0.57	0.00	2.00
	Overall	1.59	0.57	0.00	2.00
Risks	Black	1.87	1.31	0.00	4.00
	White	2.05	1.27	0.00	4.00
	Overall	1.96	1.30	0.00	4.00
Socialization and Daily Function	Black	2.49	0.98	0.00	4.00
	White	2.57	1.00	0.00	4.00
	Overall	2.53	0.99	0.00	4.00

Wellness	Black	2.77	1.76	0.00	6.00
	White	3.07	1.74	0.00	6.00
	Overall	2.92	1.76	0.00	6.00
VI-SPDAT total score	Black	8.92	3.41	1.00	16.00
	White	9.42	3.41	1.00	16.00
	Overall	9.18	3.42	1.00	16.00
Length of time homeless	Black	731.80	655.40	0.00	1959.00
	White	715.55	639.74	0.00	1959.00
	Overall	723.68	647.48	0.00	1959.00
Age	Black	48.87	12.00	19.00	88.00
	White	48.65	12.00	18.00	83.00
	Overall	48.76	12.00	18.00	88.00

4.3 Propensity Score Matching: Subsample: Families

Research questions two through four were also intended to examine a families with minor children subsample of the overall sample and excluded all single individual households and heads of household of families with minor children who did not have complete data on the Family VI-SPDAT total and subscale scores. To ensure the families subsample was also balanced, a copy of the data set was made and all observations without complete data on Family VI-SPDAT total and subscale scores were removed prior to attempting propensity score matching. Multivariate logistic regression (SAS PROC LOGISTIC) was attempted to calculate the predicted probability of the dependent variable (race) and propensity score for each observation in the subsample. The multivariate logistic regression model failed to converge and returned a warning of quasi-complete separation on the race variable. Quasi-complete separation occurs in logistic regression when the outcome variable (in this case race) separates a predictor variable or variables in such a way that the dependent variable has a cell size of zero for at least one category of the independent variable (Lu, 2016). Examination of the data revealed that the sample had 502 Black heads of household compared to 53 White heads of household. Three variables showed no White heads of household in one of the binary categories: three times homeless in three years, length of time homeless 731-1096 days, and length of time homeless 1097 or more days. In addition, pre-match, the dataset had only 2 White veterans and three White youth; two of the primary foci of the sub-population analyses for the Family VI-SPDAT. Since the outcome variable, race, is binary: Black and White, the sample size was small but the model was large, all included predictors were binary variables created from statically significant predictors of study outcomes for the

subsample, and the regression model was being fit for the purpose of propensity score matching, traditional methods such as collapsing categories, removing predictors, or using the Exact method were not feasible (Lu, 2016). In addition, had the multivariate model converged, the maximum sample size possible after propensity matching was only fifty-three people because there were only fifty-three White people in the sample; an insufficient sample size to complete the proposed analyses on the Family VI-SPDAT (Newsom, 2021). For these reasons, all models examining the Family VI-SPDAT have been eliminated from the analyses. The research questions in this chapter have been modified to reflect the actual questions and models that were examined.

4.4 Program Outcomes by Race and Subpopulation

Research Question 1: Using Homeless Management Information System (HMIS) data, are their racial differences in program outcome (exit to housing/ exit to homelessness)? Does this differ by sub-population status (unaccompanied youth age 18-24, veteran, domestic violence survivor, families with children)?

Program Outcome and Race

A multinomial regression was performed to ascertain the effects of race on the likelihood that households will exit homeless programs to a permanent destination versus temporary, institutional, or other destinations. As shown in Table 4.7, compared to White individuals, Black individuals are less likely to exit to a temporary destination vs. permanent destination ($b = -0.21$, $PP = .44$) and also less likely to exit to an institutional destination vs. a permanent destination ($b = -0.57$, $PP = .36$). Race was not associated with exits to other vs. permanent destinations.

Table 4.7*Multinomial Regression Assessing Program Outcome by Race (n = 4870)*

	Temporary vs. Permanent				Institution vs. Permanent				Other vs. Permanent			
Predictor	<i>b</i>	<i>SE</i>	<i>PP</i>	<i>p</i>	<i>b</i>	<i>SE</i>	<i>PP</i>	<i>p</i>	<i>b</i>	<i>SE</i>	<i>PP</i>	<i>p</i>
Intercept	-1.12	0.07	-	< .001	-2.19	0.11	-	< .001	0.35	0.04	-	< .001
Race: Black	-0.21	0.10	0.44	.04	-0.57	0.18	0.36	.001	-0.01	0.06	0.50	.92

Note. Model [$\chi^2(3) = 15.39, p=.002$]. $n = 4870$. Race refers to two categories: Black individuals and White individuals. Ref = Permanent Housing (1); Ref=White (0).

PP = Predicted probability.

Program Outcome, Race, and Unaccompanied Youth

A multinomial regression was performed to ascertain the effects of race and being an unaccompanied youth on the likelihood that households will exit homeless programs to a permanent destination versus temporary, institutional, or other destinations. The main effect regression model was statistically significant. Controlling for youth, there was a main effect for race. Compared to White individuals, Black individuals were less likely to exit to a temporary vs. permanent destination ($b = -0.21$, $PP = .45$) and also less likely to exit to an institutional vs. permanent destination ($b = -0.57$, $PP = 0.36$). Race was not associated with exits to other vs. permanent destinations. Controlling for race, there was a main effect for unaccompanied youth. Compared to non-youth (25 years or older), youth were less likely to exit to a temporary vs. permanent destination ($b = -0.54$, $PP = 0.37$) and less likely to exit to an other vs. permanent situation ($b = -0.25$, $PP = 0.44$). Being an unaccompanied youth was not associated with exiting to an institutional vs. permanent situation. A second multinomial regression was run to test if the relationship between race and program outcome was moderated by being an unaccompanied youth (18-24 years old). There was no evidence of a moderating effect.

Table 4.8

Multinomial Regression Assessing Program Outcome by Race and Unaccompanied Youth Status and Race Moderated by Unaccompanied Youth Status (n = 4870)

Predictor	Main Effects Model									Interaction Effects Model								
	Temporary vs. Permanent			Institution vs. Permanent			Other vs. Permanent			Temporary vs. Permanent			Institution vs. Permanent			Other vs. Permanent		
	<i>b</i> (SE)	<i>PP</i>	<i>p</i>	<i>b</i> (SE)	<i>PP</i>	<i>p</i>	<i>b</i> (SE)	<i>PP</i>	<i>p</i>	<i>b</i> (SE)	<i>PP</i>	<i>p</i>	<i>b</i> (SE)	<i>PP</i>	<i>p</i>	<i>b</i> (SE)	<i>PP</i>	<i>p</i>
Intercept	-1.08 (0.07)	-	<.001	-2.16 (0.11)	-	<.001	0.37 (0.05)	-	<.001	-1.08 (0.07)	-	<.001	-2.14 (0.11)	-	<.001	0.36 (0.05)	-	<.001
Race:	-0.21	0.45	.04	-0.57	0.36	<.001	-0.01	0.50	.93	-0.22	0.45	.04	-0.63	0.35	<.001	0.02	0.50	.82
Black	(0.10)			(0.18)			(0.06)			(0.10)			(0.18)			(0.07)		
Population:	-0.54	0.37	.02	-0.55	0.37	.17	-0.25	0.44	.04	-0.65	0.34	.05	1.30	0.79	.07	-0.09	0.48	.60
Youth	(0.23)						(0.12)			(0.33)			(0.73)			(0.18)		
	(0.23)																	
Black*Youth										0.22 (0.46)	0.55	.63	1.39 (0.87)	0.80	.11	-0.31 (0.25)	0.42	.21

Note. Main effect model: [$\chi^2(6) = 24.21, p < .001$]. $n = 4870$. Race refers to two categories: Black individuals and White individuals. Ref=White (0). Reference group for “youth” predictor is individuals age 25 and greater. Reference for program outcome = permanent housing (1). *PP* = predicted probability.

Program Outcome, Race, and Veteran Status

A multinomial regression was performed to ascertain the effects of race and veteran status on the likelihood that households will exit homeless programs to a permanent destination versus temporary, institutional, or other destinations. The main effect model was statistically significant. A second model was run to test if the relationship between race and program outcome was moderated by veteran status (non-veteran vs. veteran). Veteran status moderates the association between race and exiting to a temporary housing destination vs. a permanent destination ($b = -0.89$, $SE=0.34$, $p = .01$). Figure 4.1 graphs the interaction showing the change in the predicted probability of exiting to a temporary vs. permanent housing destination for veterans by race. Overall, the significant interaction suggests that the relationship between exiting to a temporary vs. permanent destination and race varies by veteran status. Among White individuals, veterans have a greater probability of exiting to a temporary vs. permanent destination compared to non-veterans. However, the relationship among Black individuals is opposite than it is for White individuals. Among Black individuals, veterans have a lower probability of exiting to temporary vs. permanent destination compared to non-veterans.

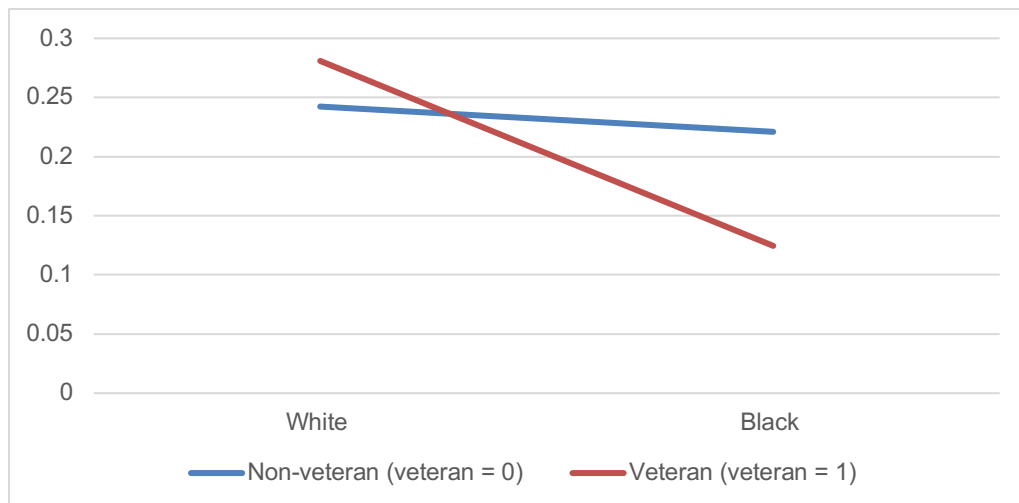


Figure 4.1: *Veteran Status and Predicted Probability of Exiting to a Temporary vs. Permanent Destination*

Table 4.9

Multinomial Regression Assessing Program Outcome by Race and Veteran Status and Race Moderated by Veteran Status (n = 4870)

	Main Effects Model									Interaction Effects Model								
	Temporary vs. Permanent			Institution vs. Permanent			Other vs. Permanent			Temporary vs. Permanent			Institution vs. Permanent			Other vs. Permanent		
Predictor	<i>b</i> (SE)	PP	<i>p</i>	<i>b</i> (SE)	PP	<i>p</i>	<i>b</i> (SE)	PP	<i>p</i>	<i>b</i> (SE)	PP	<i>p</i>	<i>b</i> (SE)	PP	<i>p</i>	<i>b</i> (SE)	PP	<i>p</i>
Intercept	-1.10 (0.07)	-	<.001	-2.24 (0.11)	-	<.001	0.41 (0.05)	-	<.001	-1.14 (0.07)	-	<.001	-2.29 (0.12)	-	<.001	0.42 (0.05)	-	<.001
Race:	-0.21	0.45	.04	-0.57	0.36	.001	-0.003	0.50	.95	-0.12	0.47	.27	-0.45	0.39	.02	-0.03	0.49	.71
Black	(0.10)			(0.18)			(0.06)			(0.11)			(0.20)			(0.07)		
Population:	0.15	0.54	.35	0.34	0.58	.14	-0.63	0.35	<.001	0.20	0.55	.33	0.60	0.65	.03	-0.81	0.31	<.001
Veteran	(0.16)			(0.23)			(0.11)			(0.20)			(0.28)			(0.16)		
Black*Veteran										-0.89 (0.34)	0.29	.01	-0.79 (0.52)	0.31	.13	0.32 (0.22)	0.58	.14

Note. Main effect model [$\chi^2(6) = 58.92, p < .001$]. $n = 4870$. Race refers to two categories: Black individuals and White individuals. Ref=White (0). Reference group for “veteran” predictor is non-veterans (0). Reference for program outcome = permanent housing (1). *PP* = predicted probability

Program Outcome, Race, and Domestic Violence

A multinomial regression was performed to ascertain the effects of race and experiencing domestic violence on the likelihood that households will exit homeless programs to a permanent destination versus temporary, institutional, or other destinations. The main effect regression model was statistically significant. Controlling for domestic violence, there was a significant main effect for race. Compared to White individuals, Black individuals are less likely to exit to a temporary vs. permanent situation ($b = -0.23$, $PP = 0.44$) and less likely to exit to an institutional vs. permanent destination ($b = -0.59$, $PP = 0.36$). Race was not associated with exits to other vs. permanent destinations. Controlling for race, there was also a significant main effect for domestic violence. Compared to those without a history of domestic violence, those who reported experiencing domestic violence were less likely to exit to a temporary vs. permanent destination ($b = -0.50$, $PP = 0.38$), less likely to exit to an institutional vs. permanent destination ($b = -0.70$, $PP = 0.33$), and less likely to exit to an other vs. permanent destination ($b = -0.85$, $PP = 0.30$). A second multinomial regression was run to test if the relationship between race and program outcome was moderated by domestic violence. There was no evidence of a moderating effect.

Table 4.10

Multinomial Regression Assessing Program Outcome by Race and Domestic Violence and Race Moderated by Domestic Violence
($n = 4870$)

Predictor	Main Effects Model									Interaction Effects Model								
	Temporary vs.			Institution vs.			Other vs.			Temporary vs.			Institution vs.			Other vs.		
	Permanent			Permanent			Permanent			Permanent			Permanent			Permanent		
	<i>b</i> (<i>SE</i>)	<i>PP</i>	<i>p</i>	<i>b</i> (<i>SE</i>)	<i>PP</i>	<i>p</i>	<i>b</i> (<i>SE</i>)	<i>PP</i>	<i>p</i>	<i>b</i> (<i>SE</i>)	<i>PP</i>	<i>p</i>	<i>b</i> (<i>SE</i>)	<i>PP</i>	<i>p</i>	<i>b</i> (<i>SE</i>)	<i>PP</i>	<i>p</i>
Intercept	-0.99 (0.08)	-	<.001	-2.02 (0.12)	-	<.001	0.55 (0.05)	-	<.001	-1.41 (0.14)	-	<.001	-2.90 (0.27)	-	<.001	-0.22 (0.10)	-	.02
Race:	-0.23 (0.10)	0.44	.02	-0.59 (0.18)	0.36	<.001	-0.03 (0.06)	0.49	.56	-0.40 (0.22)	0.50	.09	-0.20 (0.40)	0.45	.63	-0.20 (0.14)	0.45	.16
Black																		
Population:	-0.50 (0.12)	0.38	<.001	-0.70 (0.22)	0.33	<.001	-0.85 (0.08)	0.30	<.001	0.40 (0.20)	0.60	.01	0.86 (0.30)	0.70	.003	0.75 (0.11)	0.68	<.001
Domestic Violence																		
Black*Domestic										0.19 (0.24)	0.55	.45	-0.48 (0.44)	0.38	.62	0.20 (0.15)	0.55	.19
Violence																		

Note. Main effect model [$X^2(6) = 140.32, p < .001$]. $n = 4870$. Race refers to two categories: Black individuals and White individuals. Ref=White (0). Reference group for “domestic violence” predictor is no domestic violence (0). Reference for program outcome = permanent housing (1). *PP* = predicted probability.

4.4 VI-SPDAT Total Score by Race and Subpopulation

Research Question 2: According to Coordinated Entry assessment data, are there racial differences in overall VI-SPDAT scores among persons experiencing homelessness? Does this differ by sub-population status (unaccompanied youth age 18-24, veteran, domestic violence survivor)?

VI-SPDAT Total Score and Race

A linear regression analysis was conducted to test if race significantly predicted VI-SPDAT total score. The results of the regression analysis were significant, $R^2 = 0.01$, $F(1676) = 9.17$, $p = .003$. Albeit a small effect size (1%), it was found that race significantly predicted VI-SPDAT total score ($b = -0.50$, $p = .003$). Specifically, Black individuals scored 0.50 points lower than White individuals on the VI-SPDAT total score.

Table 4.11

Linear Regression Analysis: VI-SPDAT Total Score Based on Race (n = 1677)

Predictors	<i>b</i>	<i>SE b</i>	β	<i>p</i>
Intercept	9.43	0.12	-	<.001
Race:	-0.50	0.17	-0.07	.003
Black				

Note. Model [$F(1676) = 9.17$], $p = .003$, $n = 1677$. $R^2 = .01$. β =standardized estimate. Race refers to two categories: Black individuals and White individuals. Ref=White (0).

VI-SPDAT Total Score, Race, and Unaccompanied Youth

A multiple linear regression analysis was conducted to test if race and being an

unaccompanied youth was related to VI-SPDAT total score. While the effect size is small (1%), the main effect model indicated that race and being an unaccompanied youth significantly predicted VI-SPDAT total score, $R^2 = .01$, $F(2, 1675) = 11.29$, $p < .001$. As shown in Table 4.12, when controlling for youth, Black individuals scored 0.51 points lower than White individuals on the VI-SPDAT total score ($b = -.51$, $p = .002$). When controlling for race, being an unaccompanied youth was also a significant predictor of VI-SPDAT total score. Youth score 2.20 points lower than non-youth on the VI-SPDAT total score ($b = -2.20$, $p < .001$). We ran a second model to test if the relationship between race and VI-SPDAT total score was moderated by being an unaccompanied youth. As shown in Table 4.12, there is no evidence to suggest that being an unaccompanied youth moderates the relationship between race and VI-SPDAT total score.

Table 4.12

Linear Regression Analysis: VI-SPDAT Total Score Based on Race, Unaccompanied Youth and Race Moderated by Unaccompanied Youth (n = 1677)

Predictors	Main Effect Model			Interaction Effect Model		
	<i>b (se)</i>	β	<i>p</i>	<i>b (se)</i>	β	<i>p</i>
Intercept	9.48 (0.12)	-	<.001	9.47 (0.12)	-	<.001
Race:	-0.51	-0.08	.002	-0.50	-0.07	.003
Black	(0.17)			(0.17)		
Population:	-2.20	-0.09	<.001	-1.80	-0.07	0.03
Youth	(0.60)			(0.80)		
Race X Youth				-0.84 (1.20)	-0.02	0.50

Note. Main effect model [$F(2, 1675) = 11.29$], $p < .001$. $n = 1677$. $R^2 = .01$. β =standardized estimate.

Note. Interaction effect model [$F(3, 1674) = 7.68$], $p < .001$. $n = 1677$. $R^2 = .01$. β =standardized estimate. Race refers to two categories: Black individuals and White individuals. Ref=White (0). Reference group for “youth” predictor is individuals age 25 years old and greater (0).

VI-SPDAT Total Score, Race, and Veteran Status

A multiple linear regression analysis was conducted to test if race and being a veteran was related to VI-SPDAT total score. Although the effect size is small (1%), the main effect model of the regression indicated that race and veteran status significantly predicted VI-SPDAT total score, $R^2 = 0.01$, $F(2, 1675) = 9.48$, $p < .001$. As shown in Table 4.13, there was a significant main effect for race. When controlling for veteran status, Black individuals scored 0.51 points lower than White individuals on the VI-SPDAT total score ($b = -.51$, $p = .002$). There was also a significant main effect for veteran status. When controlling for race, veterans scored .90 points lower than non-veterans on the VI-SPDAT total score ($b = -.90$, $p = .002$). A second model was run to test if the relationship between race and VI-SPDAT total score was moderated by being a veteran. As shown in Table 4.13, there is no evidence to suggest that being a veteran moderates the relationship between race and VI-SPDAT total scores.

Table 4.13

Linear Regression Analysis: VI-SPDAT Total Score Based on Race, Veteran Status and Race Moderated by Veteran Status
(n = 1677)

Predictors	Main Effect Model			Interaction Effect Model		
	<i>b (se)</i>	β	<i>p</i>	<i>b (se)</i>	β	<i>p</i>
Intercept	9.51 (0.12)	-	< .001	9.50 (0.12)	-	< .001
Race:	-0.51	-0.07	.002	-0.50	-0.07	.004
Black	(0.17)			(0.17)		
Population:	-0.90	-0.08	.002	-0.85		.04
Veteran	(0.29)			(0.40)	-0.01	
Race X Veteran				-0.10 (0.58)	-0.01	0.90

Note. Main effect model [$F(2, 1675) = 9.48$], $p < .001$. $n = 1677$. $R^2 = .01$. β =standardized estimate.

Note. Interaction effect model [$F(3, 1674) = 6.32$], $p < .001$. $n = 1677$. $R^2 = .01$. β =standardized estimate. Race refers to two categories: Black individuals and White individuals. Ref=White (0).

Reference group for “veteran” predictor is non-veteran.

VI-SPDAT Total Score, Race, and Domestic Violence

A multiple linear regression analysis was conducted to test if race and experiencing domestic violence was related to VI-SPDAT total score. The main effect model of the regression was significant, $R^2 = 0.03$, $F(2, 1675) = 21.61$, $p < .001$, but the effect size was small (3%). As shown in Table 4.14, when controlling for domestic violence, Black individuals scored 0.46 points lower than White individuals on the VI-SPDAT total score ($b = -.46$, $p = .01$). There was also a significant main effect for DV ($b = 1.20$, $p < .001$). When controlling for race, individuals who reported experiencing DV scored 1.21 points higher on the VI-SPDAT total score than those who reported no history of DV. A second model was run to test if the relationship between race and VI-SPDAT total score was moderated by experiencing domestic violence. As shown in Table 4.14, there is no evidence to suggest that experiencing domestic violence moderates the relationship between race and VI-SPDAT total scores.

Table 4.14

Linear Regression Analysis: VI-SPDAT Total Score Based on Race, Domestic Violence and Race Moderated by Domestic Violence (n = 1677)

Predictors	Main Effect Model			Interaction Effect Model		
	<i>b (se)</i>	β	<i>p</i>	<i>b (se)</i>	β	<i>p</i>
Intercept	9.16 (0.13)	-	< .001	9.21 (0.13)	-	< .001
Race:	-0.46	-0.07	.005	-0.53	-0.08	.004
Black	(0.17)			(0.18)		
Population:	1.21	0.14	< .001	1.03	0.12	< .001
Domestic Violence	(0.21)			(0.28)		
Race X Domestic Violence				0.38 (0.42)	0.03	0.37

Note. Main effect model [$F(2, 1675) = 21.61, p < .001, n = 1677, R^2 = .03, \beta = \text{standardized estimate}$].

Note. Interaction effect model [$F(3, 1674) = 14.68, p < .001, n = 1677, R^2 = .03, \beta = \text{standardized estimate}$].

Race refers to two categories: Black individuals and White individuals. Ref=White (0).

Reference group for “domestic violence” predictor is no domestic violence.

4.5 VI-SPDAT Subscale Scores, Race, and Subpopulation

Research Question 3: Are there racial differences in VI-SPDAT subscale scores?

Does this differ by sub-population status (unaccompanied youth age 18-24, veteran, domestic violence survivor, families with children)?

VI-SPDAT Subscale Scores and Race

Linear regression analyses were conducted to test if race was related to VI-SPDAT History of Housing and Homelessness (History), Socialization and Daily Functioning (Social), Risks, and Wellness subscale scores. The effect sizes were small (1% each); however, it was found that race significantly predicted VI-SPDAT subscale score, Risks ($b = -.18, p = 0.01$). Specifically, Black individuals scored 0.18 points lower than White individuals on the VI-SPDAT Risks subscale. Race also significantly predicted VI-SPDAT subscale score, Wellness ($b = -.30, p = .001$). Black individuals scored 0.30 points lower than White individuals on the VI-SPDAT Wellness subscale. There were not significant effects for race on History of Housing and Homelessness or Socialization and Daily Functioning VI-SPDAT subscales.

Table 4.15*Linear Regression Analysis: VI-SPDAT Subscale Score by Race (n = 1677)*

Predictors	History			Social			Risks			Wellness		
	<i>b (se)</i>	β	<i>p</i>	<i>b (se)</i>	β	<i>p</i>	<i>b (se)</i>	β	<i>p</i>	<i>b (se)</i>	β	<i>p</i>
Intercept	1.57 (0.02)	-	<.001	2.60 (0.03)	-	<.001	2.10 (0.04)	-	<.001	3.10 (0.06)	-	<.001
Race: Black	0.04 (0.03)	0.03	.18	-0.07 (0.05)	-0.04	.13	-0.18 (0.06)	-0.07	.006	-0.30 (0.10)	-0.10	.001

Note. Model: History: [$F(1, 1676) = 1.80$], $p = .20$. $n = 1677$. $R^2 = .001$ β =standardized estimate.

Note. Model: Social: [$F(1, 1676) = 2.25$], $p = .13$. $n = 1677$. $R^2 = .001$. β =standardized estimate.

Note. Model: Risks [$F(1, 1676) = 7.66$], $p = .006$. $n = 1677$. $R^2 = .01$. β =standardized estimate.

Note. Model: Wellness [$F(1, 1676) = 12.27$], $p = .001$. $n = 1677$. $R^2 = .01$. β =standardized estimate.

Race refers to two categories: Black individuals and White individuals. Ref=White (0).

VI-SPDAT Subscale Scores, Race, and Unaccompanied Youth

Multiple linear regression analyses were conducted to test if race and being an unaccompanied youth was related to VI-SPDAT subscale scores. Although the effect sizes were small, there were significant relationships between race, being an unaccompanied youth, and History of Housing and Homelessness (1%), Risks (1%), and Wellness (1%) subscale scores. In main effect model 1: History of Housing and Homelessness subscale, race and unaccompanied youth predicted History of Housing and Homelessness subscale score ($R^2 = 0.01$, $F(2, 1675) = 6.18$, $p = .002$). There was a significant main effect for unaccompanied youth. As shown in Table 4.16, when controlling for race, youth scored 0.32 points lower than non-youth on the VI-SPDAT History of Housing and Homelessness subscale ($b = -0.32$, $p = .001$). In main effect model 3: Risks subscale, race and unaccompanied youth predicted Risks subscale score ($R^2 = .01$, $F(2, 1675) = 6.85$, $p = .001$). There was a significant main effect for race. When controlling for youth, compared to White individuals, Black individuals scored 0.18 points lower on the Risks subscale ($b = -0.18$, $p = 0.01$). There was a significant main effect for youth. When controlling for race, youth scored 0.56 points lower than non-youth on the Risks subscale ($b = -0.56$, $p = 0.01$). In main effect model 4: Wellness subscale, race and being an unaccompanied youth significantly predicted VI-SPDAT Wellness subscale score ($R^2 = .01$, $F(2, 1675) = 9.84$, $p < .001$). There was a significant main effect for race. When controlling for youth, compared to White individuals, Black individuals scored 0.30 points lower on the Wellness subscale ($b = -0.30$, $p < .001$). There was a significant main effect for youth. When controlling for race, youth scored 0.83 points lower than non-youth on the Wellness subscale ($b = -0.83$, $p = 0.01$). As

shown in Table 4.16, there is no evidence to suggest that being an unaccompanied youth moderates the relationship between race and VI-SPDAT subscale scores.

Table 4.16

Linear Regression Analysis: VI-SPDAT Subscales Score Based on Race, Unaccompanied Youth and Race Moderated by Unaccompanied Youth (n = 1677)

Predictors	Main Effect Model			Interaction Effect Model		
	<i>b (se)</i>	β	<i>p</i>	<i>b (se)</i>	β	<i>p</i>
Model 1: History Subscale						
Intercept	1.60 (0.02)	-	<.001	1.60 (0.02)	-	<.001
Race:	0.04	0.03	.20	0.04	0.03	.19
Black	(0.03)			(0.03)		
Population:	-0.32	0.10	.001	-0.30	-0.07	.03
Youth	(0.112)			(0.13)		
Race X Youth				-0.05 (0.20)	-0.01	.81
Model 2: Socialization and Daily Functioning Subscale						
Intercept	2.60 (0.03)	-	<.001	2.60 (0.03)	-	<.001
Race:	-0.07	-0.04	.13	-0.08	-0.04	.12
Black	(0.05)			(0.05)		

Population:	-0.30	-0.04	.09	-0.40	-0.05	.13
Youth	(0.17)			(0.24)		
Race X Youth				0.12	0.01	.73
				(0.35)		
Model 3: Risks Subscale						
Intercept	2.10	-	<.001	2.10	-	<.001
	(0.04)			(0.05)		
Race:	-0.18	-0.07	.01	-0.17	-0.07	.01
Black	(0.06)			(0.06)		
Population:	-0.56	-0.06	.01	-0.39	-0.04	.20
Youth	(0.23)			(0.31)		
Race X Youth				-0.40	-0.03	.43
				(0.46)		
Model 4: Wellness Subscale						
Intercept	3.10	-	<.001	3.10	-	<.001
	(0.06)			(0.06)		
Race:	-0.30	-0.10	<.001	-0.30	-0.10	<.001
Black	(0.10)			(0.110)		
Population:	-0.83	-0.10	.01	-0.60	-0.05	.16

Youth	(0.31)	(0.42)		
Race X Youth		-0.54 (0.62)	-0.03	.38

Note. Main effect model: History [$F(2, 1675) = 6.18$], $p = .002$. $n = 901$. $R^2 = .01$ Interaction effect model: History [$F(3, 1674) = 4.14$], $p = .01$. $n = 1677$. $R^2 = .01$. β =standardized estimate.

Note. Main effect model: Socialization and Daily Functioning [$F(2, 1675) = 2.60$], $p = .07$. $n = 1677$. $R^2 = .003$. Interaction effect model: Socialization and Daily Functioning: [$F(3, 1674) = 1.77$], $p = 0.15$. $n = 1677$. $R^2 = .003$. β =standardized estimate.

Note. Main effect model: Risks [$F(2, 1675) = 6.85$], $p = 0.001$. $n = 1677$. $R^2 = .01$. Interaction effect model: Risks: [$F(3, 1674) = 4.78$], $p = .003$. $n = 1677$. $R^2 = .01$. β =standardized estimate.

Note. Main effect model: Wellness [$F(2, 1675) = 9.84$], $p < .001$. $n = 1677$. $R^2 = .01$. Interaction effect model: Wellness: [$F(3, 1674) = 6.82$], $p < .001$. $n = 1677$. $R^2 = .01$. β =standardized estimate.

Race refers to two categories: Black individuals and White individuals. Ref=White (0).

Reference group for “youth” predictor is individuals age 19 and greater (0).

VI-SPDAT Subscale Scores, Race, and Veteran Status

Multiple linear regression analyses were conducted to test if race and being a veteran were related to VI-SPDAT subscale scores. Although the effect sizes were small, there were significant relationships between race, veteran status, and Risks (1%) and Wellness (2%) subscales. In main effect model 3: Risks, race and veteran status predicted Risks subscale score ($R^2 = .01$, $F(2, 1675) = 9.67$, $p < .001$). There was a significant main effect for race. When controlling for veteran status, compared to White individuals, Black individuals scored 0.18 points lower on the Risks subscale ($b = -0.18$, $p = .01$). There was also a significant main effect for veteran status. When controlling for veteran status, compared to non-veterans, veterans scored 0.37 points lower on the Risks subscale ($b = -0.37$, $p = .001$). In main effect model 4: Wellness subscale, race and veteran status predicted VI-SPDAT Wellness subscale score ($R^2 = .02$, $F(2, 1675) = 12.54$, $p < .001$). There was a significant main effect for race. When controlling for veteran status, compared to White individuals, Black individuals scored 0.30 points lower on the Wellness subscale ($b = -0.30$, $p < .001$). There was also a significant main effect for veteran status. When controlling for race, compared to non-veterans, veterans scored 0.53 points lower on the Risks subscale ($b = -0.53$, $p < .001$). As shown in Table 4.17, there is no evidence to suggest that veteran status moderates the relationship between race and VI-SPDAT subscale scores.

Table 4.17

Linear Regression Analysis: VI-SPDAT Subscales Score Based on Race, Veteran Status, and Race Moderated by Veteran Status
(n = 1677)

Predictors	Main Effect Model			Interaction Effect Model		
	<i>b (se)</i>	β	<i>p</i>	<i>b (se)</i>	β	<i>p</i>
Model 1: History Subscale						
Intercept	1.58 (0.02)	-	<.001	1.60 (0.02)	-	<.001
Race:	0.04	0.03	.19	0.03	0.03	.27
Black	(0.03)			(0.03)		
Population:	-0.07	-0.04	.15	-0.10	-0.05	0.16
Veteran	(0.05)			(0.07)		
Race X Veteran				0.05 (0.10)	0.02	.62
Model 2: Socialization and Daily Functioning Subscale						
Intercept	2.60 (0.04)	-	<.001	2.60 (0.04)	-	<.001
Race:	-0.07	-0.04	.13	-0.07	-0.03	.18
Black	(0.05)			(0.05)		

Population:	-0.13	-0.04	.12	-0.11	-0.03	.37
Veteran	(0.08)			(0.12)		
Race X Veteran				-0.05	-0.01	.75
				(0.17)		
Model 3: Risks Subscale						
Intercept	2.10	-	<.001	2.10	-	<.001
	(0.05)			(0.05)		
Race:	-0.18	-0.10	.01	-0.15	-0.06	.02
Black	(0.06)			(0.10)		
Population:	-0.37	0.11	.001	-0.24	-0.05	.12
Veteran	(0.160)			(0.22)		
Race X Veteran				-0.28	-0.04	.21
				(0.22)		
Model 4: Wellness Subscale						
Intercept	3.12	-	<.001	3.13	-	<.001
	(0.06)			(0.06)		
Race:	-0.30	-0.10	<.001	-0.32	-0.09	<.001
Black	(0.09)			(0.09)		
Population:	-0.53	-0.09	<.001	-0.63	-0.10	.002

Veteran	(0.15)	(0.21)		
Race X Veteran		0.21	0.03	.47
		(0.30)		

Note. Main effect model: History [$F(2, 1675) = 1.96$], $p = .14$. $n = 1677$. $R^2 = .002$ Interaction effect model: History [$F(3, 1674) = 1.39$], $p = .25$. $n = 1677$. $R^2 = .002$. β =standardized estimate.

Note. Main effect model: Socialization and Daily Functioning: [$F(2, 1675) = 2.34$], $p = 0.10$. $n = 1677$. $R^2 = .003$. Interaction effect model: Socialization and Daily Functioning: [$F(3, 1674) = 1.60$], $p = .19$. $n = 1677$. $R^2 = .003$. β =standardized estimate.

Note. Main effect model: Risks [$F(2, 1675) = 9.67$], $p < .001$. $n = 1677$. $R^2 = .01$. Interaction effect model: Risks: [$F(3, 1674) = 6.97$], $p < .001$. $n = 1677$. $R^2 = .01$. β =standardized estimate.

Note. Main effect model: Wellness [$F(2, 1675) = 12.54$], $p < .001$. $n = 1677$. $R^2 = .02$. Interaction effect model: Wellness: [$F(3, 1674) = 8.53$], $p < .001$. $n = 1677$. $R^2 = .02$. β =standardized estimate.

Race refers to two categories: Black individuals and White individuals. Ref=White (0).

Reference group for “veteran status” predictor is non-veterans (0).

VI-SPDAT Subscale Scores, Race, and Domestic Violence

Multiple linear regression analyses were conducted to test if race and experiencing domestic violence were related to VI-SPDAT subscale scores. Although the effect sizes were small, there were significant relationships between race, domestic violence, and Socialization and Daily Functioning (1%), Risks (3%), and Wellness (2%) subscale scores. In main effect model 2: Socialization and Daily Functioning: race and domestic violence predicted Socialization and Daily Functioning subscale score ($R^2 = .01$, $F(2, 1675) = 8.62$, $p < .001$). There was a significant main effect for domestic violence. Compared to persons who did not experience DV, those who experienced DV scored 0.24 points higher on the Socialization and Daily Functioning subscale ($b = 0.24$, $p < .001$) when controlling for race. In main effect model 3: Risks: race and domestic violence predicted Risks subscale score ($R^2 = .03$, $F(2, 1675) = 23.40$, $p < .001$). There were significant main effects for both race and DV. Compared to White individuals, Black individuals scored 0.16 points lower on the Risks subscale ($b = -0.16$, $p = .01$) when controlling for DV status. Compared to persons who did not experience DV, persons who reported DV score 0.49 points higher on the Risks subscale ($b = 0.49$, $p < .001$) when controlling for race. In main effect model 4: Wellness subscale, race and domestic violence predicted VI-SPDAT Wellness subscale score ($R^2 = .02$, $F(2, 1675) = 20.03$, $p < .001$). There was a significant main effect for race. Compared to White individuals, Black individuals scored 0.28 points lower on the Wellness subscale ($b = -0.28$, $p = .001$) when controlling for DV status. There was also a significant main effect for DV. Compared to those who did not report DV, persons who reported DV scored 0.56 points higher on the Wellness subscale ($b = 0.56$, $p < .001$) when controlling for race. As

shown in Table 4.18, there is no evidence to suggest that domestic violence moderates the relationship between race and VI-SPDAT subscale scores.

Table 4.18

Linear Regression Analysis: VI-SPDAT Subscales Score Based on Race, Domestic Violence and Race Moderated by Domestic Violence (n = 1677)

Predictors	Main Effect Model			Interaction Effect Model		
	<i>b (se)</i>	β	<i>p</i>	<i>b (se)</i>	β	<i>p</i>
Model 1: History Subscale						
Intercept	1.57 (0.02)	-	<.001	1.56 (0.02)	-	<.001
Race:	0.04	0.03	.18	0.05	0.03	.12
Black	(0.03)			(0.043)		
Population:	0.01	0.01	.74	0.04	.03	.42
Domestic Violence	(0.03)			(0.068)		
Race X Domestic Violence				-0.06 (0.07)	-0.03	.50
Model 2: Socialization and Daily Functioning Subscale						
Intercept	2.52 (0.04)	-	<.001	2.52 (0.04)	-	<.001
Race:	-0.06	-0.03	0.20	-0.07	0.05	.17
Black ³	(0.05)			(0.074)		

Population:	0.24	0.09	<.001	0.21	0.08	.01
Domestic Violence	(0.06)			(0.08)		
Race X Domestic Violence				0.05	0.02	.66
				(0.12)		
Model 3: Risks Subscale						
Intercept	1.95	-	<.001	1.95	-	<.001
	(0.05)			(0.05)		
Race:	-0.16	-0.06	.01	-0.17	-0.07	.02
Black	(0.06)			(0.07)		
Population:	0.49	0.15	<.001	0.50	0.14	<.001
Domestic Violence	(0.08)			(0.11)		
Race X Domestic Violence				0.06	0.01	.70
				(0.20)		
Model 4: Wellness Subscale						
Intercept	2.95	-	<.001	2.98	-	<.001
	(0.06)			(0.07)		
Race:	-0.28	-0.08	.001	-0.33	-0.09	<.001
Black	(0.08)			(0.09)		
Population:	0.56	0.13	<.001	0.43	0.10	.003

Domestic Violence	(0.11)	(0.15)		
Race X Domestic Violence		0.27	0.04	.21
		(0.21)		

Note. Main effect model: History [$F(2, 1675) = 0.95$], $p = .39$. $n = 1677$. $R^2 = .001$ Interaction effect model: History [$F(3, 1674) = 0.86$], $p = .46$. $n = 1677$. $R^2 = .002$.

Note. Main effect model: Socialization and Daily Functioning [$F(2, 1675) = 8.62$], $p < .001$. $n = 1677$. $R^2 = .01$. Interaction effect model: Socialization and Daily Functioning: [$F(3, 1674) = 5.81$], $p < .001$. $n = 1677$. $R^2 = .01$. $\beta = \text{standardized estimate}$.

Note. Main effect model: Risks [$F(2, 1675) = 23.40$], $p < .001$. $n = 1677$. $R^2 = .03$. Interaction effect model: Social: [$F(3, 1674) = 15.64$], $p < .001$. $n = 1677$. $R^2 = .03$. $\beta = \text{standardized estimate}$.

Note. Main effect model: Wellness [$F(2, 1675) = 20.03$], $p < .001$. $n = 1677$. $R^2 = .02$. Interaction effect model: Wellness: [$F(3, 1674) = 13.89$], $p < .001$. $n = 1677$. $R^2 = .02$. $\beta = \text{standardized estimate}$.

Race refers to two categories: Black individuals and White individuals. Ref=White (0).

Reference group for “domestic violence” predictor is no domestic violence (0)

4.6 Housing Need Intervention Classification, VI-SPDAT Subscale Scores, Race, and Subpopulations

Research Question 4: What VI-SPDAT subscales predict overall housing need intervention classification? Does this differ by race? Does this differ by sub-population status (unaccompanied youth age 18-24, veteran, domestic violence survivor, families with children)?

VI-SPDAT Subscale Scores and Housing Need Intervention Classification

Multinomial regression analyses were performed to ascertain the effects of subscale scores on the likelihood that households would be prioritized for permanent supportive housing interventions vs. mainstream affordable housing or rapid rehousing interventions. Model 1: History of Housing and Homelessness subscale: Those who scored higher on the History subscale were less likely to be classified for mainstream affordable housing vs. permanent supportive housing ($b = -2.98$, $PP = .05$) and were less likely to be classified for rapid rehousing vs. permanent supportive housing ($b = -2.61$, $PP = .19$). Model 2: Socialization and Daily Functioning subscale: Those who scored higher on the Socialization and Daily Functioning subscale were less likely to be classified for mainstream affordable housing vs. permanent supportive housing ($b = -2.61$, $PP = .07$) and less likely to be classified for rapid rehousing vs. permanent supportive housing ($b = -1.12$, $PP = .25$). Model 3: Risks subscale: Those who scored higher on the Risks subscale were less likely to be classified for mainstream affordable housing vs. permanent supportive housing ($b = -3.50$, $PP = .03$) and less likely to be classified for rapid rehousing ($b = -1.80$, $PP = .14$). Model 4: Wellness subscale: Those

who scored higher on the Wellness subscale were less likely to be classified for mainstream affordable housing ($b = -3.44$, $PP = .03$) and less likely to be classified for rapid rehousing vs. permanent supportive housing ($b = -1.73$, $PP = .15$).

Table 4.19*Multinomial Regression: Housing Intervention Classification by VI-SPDAT subscale (n = 1678)*

Predictors	Mainstream Affordable Housing vs. Permanent Supportive Housing			Rapid Rehousing vs. Permanent Supportive Housing		
	<i>b (se)</i>	<i>PP</i>	<i>p</i>	<i>b (se)</i>	<i>PP</i>	<i>p</i>
Model 1: History Subscale						
Intercept	3.31 (0.30)		<.001	3.16 (0.25)		<.001
History	-2.98 (0.19)	0.05	<.001	-1.46 (0.14)	0.19	<.001
Model 2: Socialization and Daily Functioning Subscale						
Intercept	4.73 (0.30)		<.001	3.79 (0.23)		<.001
Social	-2.61 (0.14)	0.07	<.001	-1.12 (0.08)	0.25	<.001
Model 3: Risks Subscale						
Intercept	4.73 (0.29)		<.001	5.11 (0.26)		<.001
Risks	-3.50 (0.18)	0.03	<.001	-1.80 (0.09)	0.14	<.001
Model 4: Wellness Subscale						

Intercept	7.32 (0.38)		<.001	6.78 (0.34)		<.001
Wellness	-3.44 (0.16)	0.03	<.001	-1.73 (0.09)	0.15	<.001

Note. Model: History: [$\chi^2(2) = 324.20, p < .001$]. $n = 1678$.

Note. Model: Social: [$\chi^2(2) = 568.29, p < .001$]. $n = 1678$.

Note. Model: Risks: [$\chi^2(2) = 1107.11, p < .001$]. $n = 1678$.

Note. Model: Wellness: [$\chi^2(2) = 1448.44, p < .001$]. $n = 1678$.

Housing Intervention Classification reference group = permanent supportive housing (3).

PP = predicted probability.

VI-SPDAT Subscale Scores, Housing Need Intervention Classification, and Race

Multinomial regression analyses were performed to ascertain the effects of subscale scores and race on the likelihood that households would be prioritized for mainstream affordable housing or rapid rehousing vs. permanent supportive housing interventions. In addition to main effects models, interaction models were run for each subscale to examine if subscales moderated the relationship between race and housing intervention classification. Model 1: Interaction model: History of Housing and Homelessness subscale and race: There was a significant interaction effect between race, History subscale, and housing intervention classification. ($b = 0.55$, $SE=0.30$, $p = .05$). Figure 4.2 graphs the interaction showing the change in the predicted probability of being classified for a rapid re-housing intervention by race and History subscale score. Overall, the significant interaction suggests that the relationship between being classified for rapid re-housing and History subscale score varies by race. The graph shows that there are no meaningful racial differences in the probability of being classified for rapid rehousing vs. permanent supportive housing for those who have no history or those that have low history. No history or a score of zero for the History subscale means that a person reported sleeping most frequently in shelter, safe haven, or transitional housing and reported being homeless for less than one consecutive year and less than four or more times in the previous three years. Low history or a score of one for the History subscale means a person reported sleeping most frequently in a location other than shelter, safe haven, or transitional housing or reported being homeless for less than one consecutive year or less than four or more times in the previous three years. There is a meaningful difference between Black individuals and White individuals who report high history on

the History subscale or a score of two which means a person reported sleeping most frequently in a location other than shelter, safe haven, or transitional housing and reported being homeless for one consecutive year or four or more times in the previous three years. Black individuals who scored high on the History subscale had a higher probability of being classified for rapid housing compared to White individuals who scored high on the History subscale. When controlling for race, there was also a significant main effect for History subscale. Those who scored higher on the History subscale had lower probability of being classified for mainstream affordable housing ($b = -3.26, PP = .05$) and lower probability of being classified for rapid rehousing vs. permanent supportive housing ($b = -1.73, PP = .15$).

Model 2: Socialization and Daily Functioning subscale and race: Controlling for race, there was a significant main effect for Socialization and Daily Functioning subscale. Those who scored higher on the Socialization and Daily Functioning subscale were less likely to be classified for mainstream affordable housing vs. permanent supportive housing ($b = -2.62, PP = .07$) and less likely to be classified for rapid rehousing vs. permanent supportive housing ($b = -1.12, PP = .25$). Controlling for Socialization and Daily Functioning subscale, there was a significant main effect for race. Compared to White individuals, Black individuals had higher probability of being classified for mainstream affordable housing ($b = 0.54, PP = .63$) and rapid rehousing vs. permanent supportive housing ($b = 0.25, PP = .56$). There is no evidence to suggest that race moderates the relationship between Socialization and Daily Functioning subscale and housing intervention classification.

Model 3: Risks subscale and race: Interaction model: There was a significant interaction effect between race, Risks subscale, and housing intervention classification. ($b = -0.33, SE=0.20, p =$

.09). Figure 4.3 graphs the interaction showing the change in the predicted probability of being classified for a rapid re-housing intervention vs. permanent supportive housing intervention by race and Risks subscale score. Overall, the significant interaction suggests that the relationship between being classified for rapid re-housing vs. permanent supportive housing and Risks subscale score varies by race. The graph shows that there are no meaningful differences in the probability of being classified for rapid rehousing vs. permanent supportive housing for Black individuals vs. White individuals with the exception of those who score low-medium on the Risks subscale or a value of 2. Low-medium risk means the individual would have indicated any two of the following: four or more interactions w emergency services in the previous six months, risk for harm such as being attacked or beaten up while homeless or attempting to harm themselves or others in the past year, legal issues that may impact the ability to obtain housing or being exploited/ engaging in risky behavior. For those who scored low-medium, Black individuals have a higher probability of being classified for rapid rehousing vs. permanent supportive housing than White individuals who also scored low-medium. Controlling for race, there was a significant main effect for Risks subscale. Those who scored higher on the Risks subscale were less likely to be classified for mainstream affordable housing ($b = -3.46$, $PP = .03$) and rapid rehousing vs. permanent supportive housing ($b = -1.66$, $PP = .16$). There was also a significant main effect for race. When controlling for Risks subscale, compared to White individuals, Black individuals had a higher probability of being classified for mainstream affordable housing ($b = 1.10$, $PP = 0.75$) and rapid rehousing ($b = 1.13$, $PP = 0.76$) vs. permanent supportive housing. Model 4: Wellness subscale and race: Controlling for race, there was a significant main effect

for Wellness subscale. Those who scored higher on the Wellness subscale were less likely to be classified for mainstream affordable housing ($b = -3.44$, $PP = 0.03$) and rapid rehousing vs. permanent supportive housing ($b = -1.73$, $PP = .15$). Controlling for Wellness subscale, there was a significant main effect for race. Compared to White individuals, Black individuals had a slightly higher probability of being classified for mainstream affordable housing vs. permanent supportive housing ($b = 0.06$, $PP = .51$). There is no evidence to suggest that race moderates the relationship between Wellness subscale and housing intervention classification.

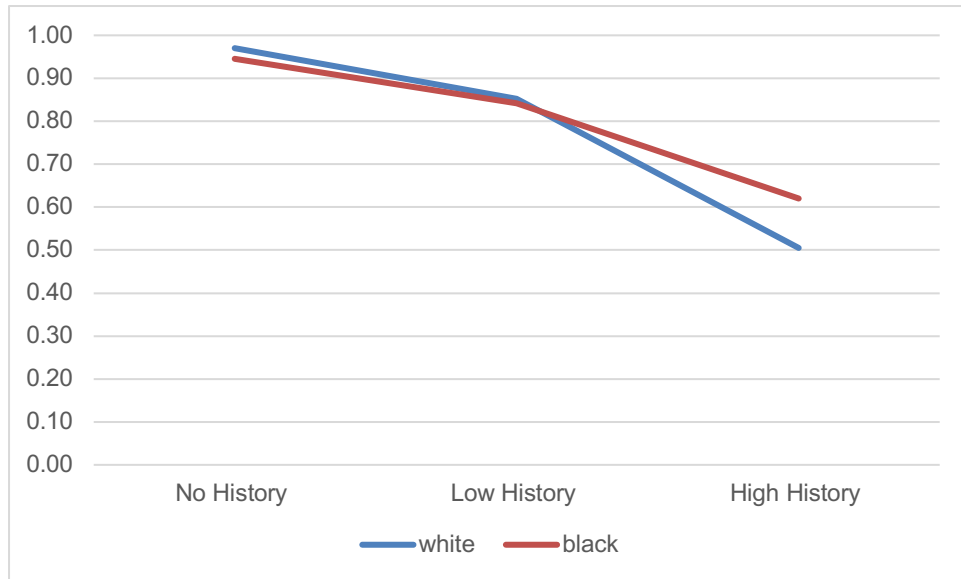


Figure 4.2: Race, History Subscale Score, and Predicted Probability of Being Classified for Rapid Rehousing

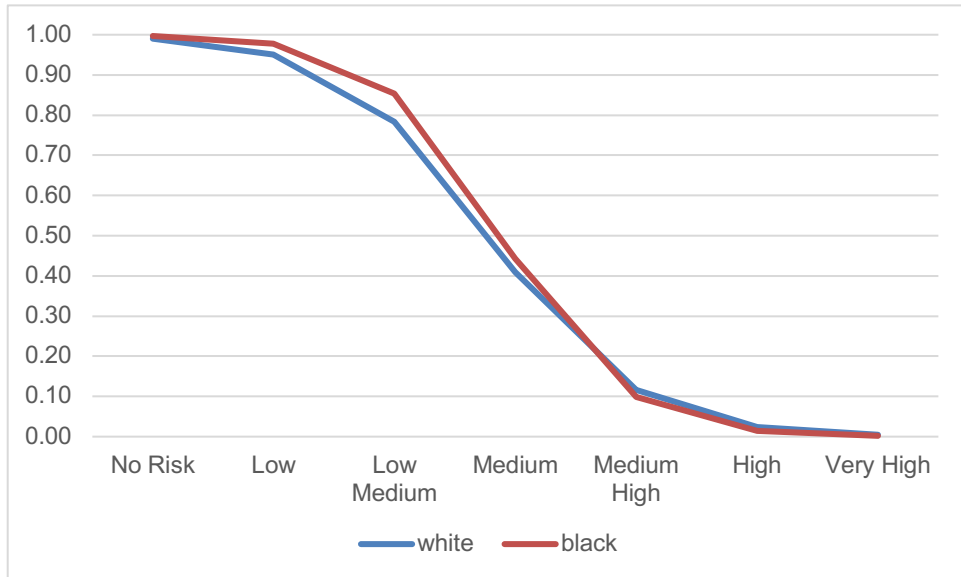


Figure 4.3: Race, Risks Subscale Score, and Predicted Probability of Being Classified for Rapid Rehousing

Table 4.20

Multinomial Regression: Housing Intervention Classification By VI-SPDAT Subscale and Race and VI-SPDAT Subscale Score Moderated by Race(n=1678)

Predictors	Main Effect Model						Interaction Effect Models					
	Mainstream Affordable Housing vs. Permanent Supportive Housing			Rapid Rehousing vs. Permanent Supportive Housing			Mainstream Affordable Housing vs. Permanent Supportive Housing			Rapid Rehousing vs. Permanent Supportive Housing		
	<i>b (se)</i>	<i>PP</i>	<i>p</i>	<i>b (se)</i>	<i>PP</i>	<i>p</i>	<i>b (se)</i>	<i>PP</i>	<i>p</i>	<i>b (se)</i>	<i>PP</i>	<i>p</i>
Model 1: History Subscale												
Intercept	3.02 (0.30)		<.001	3.03 (0.26)		<.001	3.42 (0.42)		<.001	3.48 (0.35)		<.001
History	-3.03 (0.19)	0.05	<.001	-1.50 (0.14)	0.18	<.001	-3.26 (0.30)	0.04	<.001	-1.73 (0.20)	0.15	<.001
Race:	0.72 (0.20)	0.67	<.001	0.36 (0.11)	0.59	.002	-0.18 (0.60)	0.46	0.76	-0.63 (0.51)	0.35	0.22
Black												
History X Race							0.50 (0.39)	0.62	0.20	0.55 (0.28)	0.63	0.05
Model 2: Socialization and Daily Functioning Subscale												

Intercept	4.45 (0.32)		<.001	3.66 (0.24)		<.001	4.74		<.001	3.81		<.001
							(0.44)			(0.32)		
Social	-2.62 (0.14)	0.07	<.001	-1.12 (0.08)	0.25	<.001	-2.77	0.06	<.001	-1.17	0.24	<.001
							(0.22)			(0.11)		
Race:	0.54 (0.21)	0.63	.01	0.25 (0.11)	0.56	.03	-0.02	0.50	0.98	-0.04	0.49	0.93
Black							(0.61)			(0.46)		
Socialization and Daily							0.28	0.57	0.34	0.10	0.52	0.52
Functioning X Race							(0.29)			(0.15)		
Model 3: Risks Subscale												
Intercept	4.58 (0.31)		<.001	5.00 (0.27)		<.001	4.26		<.001	4.61		<.001
							(0.38)			(0.34)		
Risks	-3.50 (0.18)	0.03	<.001	-1.80 (0.09)	0.14	<.001	-3.46	0.03	<.001	-1.66	0.16	<.001
							(0.26)			(0.12)		
Race:	0.31 (0.24)	0.58	.18	0.24 (0.14)	0.56	0.09	1.10	0.75	0.06	1.13	0.76	0.04
Black							(0.59)			(0.54)		
Risks X Race							-0.13	0.47	0.73	-0.33	0.42	0.09
							(0.36)			(0.19)		
Model 4: Wellness Subscale												

Intercept	7.29 (0.41)	<.001	6.75 (0.36)	<.001	7.70 (0.58)	<.001	7.20 (0.52)	<.001
Wellness	-3.44 (0.16)	0.03 <.001	-1.73 (0.09)	0.15 <.001	-1.85 (0.14)	0.14 <.001	-3.50 (0.24)	0.03 <.001
Race: Black	0.06 (0.26)	0.51 .05	0.05 (0.17)	0.51 .08	-0.66 (0.76)	0.34 0.39	-0.79 (0.69)	0.31 0.25
Wellness X Race					0.10 (0.32)	0.52 0.76	0.23 (0.18)	0.68 0.21

Note. Model: Main Effect Model: History: [$\chi^2(4) = 340.34, p < .001$]. $n = 1678$; Interaction Effect Model: History [$\chi^2(6) = 344.25, p < .001$]. $n = 1678$.

Note. Model: Main Effect Model: Socialization and Daily Functioning: [$\chi^2(4) = 575.85, p < .001$]. $n = 1678$; Interaction Effect Model: Socialization and Daily Functioning [$\chi^2(6) = 576.81, p < .001$]. $n = 1678$.

Note. Model: Main Effect Model: Risks: [$\chi^2(4) = 1110.14, p < .001$]. $n = 1678$; Interaction Effect Model: Risks [$\chi^2(6) = 1113.70, p < .001$]. $n = 1678$.

Note. Model: Main Effect Model: Wellness: [$\chi^2(4) = 1448.52, p < .001$]. $n = 1678$; Interaction Effect Model: Wellness [$\chi^2(6) = 1450.40, p < .001$]. $n = 1678$.

Race refers to two categories: Black individuals and White individuals. Ref=White (0).

Housing Intervention Classification reference group = permanent supportive housing (3).

PP = predicted probability.

VI-SPDAT Subscale Scores, Housing Need Intervention Classification, and Unaccompanied Youth

Multinomial regression analyses were performed to ascertain the effects of subscale scores, race, and being an unaccompanied youth on the likelihood that households would be prioritized for mainstream affordable housing or rapid rehousing, vs. permanent supportive housing interventions. Three-way interaction models were performed to examine if the relationship between the interaction of youth and subscale score and housing intervention classification varied by race but the models were unable to be estimated due to quasi-complete separation of the data. After examination of the data it was determined that the issue is multivariate in nature. For this reason it was not possible to identify the precise issue but based on my knowledge of quasi-complete separation, there was some combination of variables that yielded a separation of the data. Instead, to examine if the relationship between subscale scores and housing intervention classification varied by unaccompanied youth, separate two-way interactions models were performed to examine if the relationship between subscale and housing intervention classification was moderated by unaccompanied youth. These models are presented instead of the three-way interaction models. Model 1: History of Housing and Homelessness subscale: When controlling for unaccompanied youth, there was a significant main effect for History subscale. Those who scored higher on the History subscale had lower probability of being classified for mainstream affordable housing ($b = -2.61$, $PP = .05$) and rapid rehousing ($b = -1.46$, $PP = .19$). There was not a significant effect for unaccompanied youth. Model 2: Socialization and Daily Functioning subscale: When controlling for unaccompanied youth, there was a significant main effect for

Socialization and Daily Functioning subscale. Those who scored higher on the Socialization and Daily Functioning subscale had lower probability of being classified for mainstream affordable housing ($b = -2.61$, $PP = .07$) and rapid rehousing ($b = -1.12$, $PP = .25$) vs. permanent supportive housing. When controlling for Socialization and Daily Functioning subscale there was a significant main effect for unaccompanied youth. Compared to non-youth, youth had a higher probability of being classified for mainstream affordable housing ($b = 1.57$, $PP = .83$) vs. permanent supportive housing.

Model 3: Risks subscale: Controlling for unaccompanied youth, there was a significant main effect for Risks subscale. Those who scored higher on the Risks subscale had lower probability of being classified for mainstream affordable housing ($b = -3.48$, $PP = .03$) and rapid rehousing ($b = -1.80$, $PP = .14$) vs. permanent supportive housing. There was not a significant main effect for unaccompanied youth.

Model 4: Wellness subscale: Controlling for unaccompanied youth, there was a significant main effect for Wellness subscale. Those who scored higher on the Wellness subscale had a lower probability of being classified for mainstream affordable housing ($b = -3.44$, $PP = .03$) and rapid rehousing ($b = -1.73$, $PP = .15$) vs. permanent supportive housing. There was not a significant main effect for unaccompanied youth. As shown in Table 4.21, there is no evidence to suggest that being an unaccompanied youth moderates the relationship between subscale scores and housing intervention classification.

Table 4.21

Multinomial Regression: Housing Intervention Classification By VI-SPDAT Subscale and Unaccompanied Youth and Housing Intervention Classification and Subscale Score Moderated by Unaccompanied Youth (n = 1678)

Predictors	Main Effect Model						Interaction Effect Model					
	Mainstream Affordable Housing vs. Permanent Supportive Housing			Rapid Rehousing vs. Permanent Supportive Housing			Mainstream Affordable Housing vs. Permanent Supportive Housing			Rapid Rehousing vs. Permanent Supportive Housing		
	<i>b (se)</i>	<i>PP</i>	<i>p</i>	<i>b (se)</i>	<i>PP</i>	<i>p</i>	<i>b (se)</i>	<i>PP</i>	<i>p</i>	<i>b (se)</i>	<i>PP</i>	<i>p</i>
Model 1: History Subscale												
Intercept	3.26 (0.30)		<.001	3.15 (0.26)		<.001	3.25 (0.30)		<.001	3.13 (0.26)		<.001
History	-2.97 (0.20)	.05	<.001	-1.46 (0.14)	.19	<.001	-2.96 (0.20)	.05	<.001	-1.45 (0.14)	.19	<.001
Population: Youth	1.04 (0.60)	.74	.09	0.20 (0.50)	.55	.70	2.04 (2.25)	.88	.36	1.51 (2.15)	.82	.50
Youth X History							- 0.51 (1.37)	.38	.71	- 0.78 (1.19)	.31	.51

Model 2: Socialization
and Daily Functioning
Subscale

Intercept	4.68 (0.31)		<.001	3.78 (0.23)		<.001	4.69 (0.31)		<.001	3.78 (0.23)		<.001
Social	-2.61 (0.15)	.07	<.001	-1.12 (0.08)	.25	<.001	-2.62 (0.15)	.07	<.001	-1.12 (0.08)	.25	<.001
Population: Youth	1.57 (0.65)	.83	.02	0.38 (0.52)	.59	.46	1.37 (2.23)	.83	.80	0.62 (1.95)	.65	.75
Youth X Social							0.16 (0.90)	.54		-0.09 (0.65)	.48	.89

Model 3: Risks Subscale

Intercept	4.69 (0.29)		<.001	5.10 (0.26)		<.001	4.70 (0.29)		<.001	5.10 (0.27)		<.001
Risks	-3.48 (0.18)	.03	<.001	-1.80 (0.09)	.14	<.001	-3.50 (0.18)	.03	<.001	-1.80 (0.09)	.14	<.001
Population: Youth	1.16 (0.79)	.76	.14	0.26 (0.63)	.56	.68	0.81 (2.16)	.76	.69	0.12 (2.10)	.53	.96
Youth X Risks							0.47 (0.99)	.62	.63	0.04 (0.77)	.51	.95

Model 4: Wellness

Subscale

Intercept	7.29 (0.38)	<.001	6.78 (0.34)	<.001	7.30 (0.38)	<.001	6.76 (0.34)	<.001
Wellness	-3.44 (0.16)	.03 <.001	-1.73 (0.09)	.15 <.001	-3.46 (0.16)	.03 <.001	-1.73 (0.09)	.15 <.001
Population: Youth	0.83 (0.85)	.70 .33	-0.10 (0.66)	.48 .88	2.36 (4.08)	.91 .56	1.92 (4.01)	.87 .63
Youth X Wellness					- 0.13 (1.24)	.47 .92	-0.58 (1.11)	.36 .60

Note. Model: History: [$\chi^2(4) = 327.95, p < .001$]. $n = 1678$. Interaction effect model: History [$\chi^2(6) = 328.51, p < .001$]. $n = 1678$.

Note. Model: Socialization and Daily Functioning: $\chi^2(4) = 575.20, p < .001$. $n = 1678$. Interaction effect model: Socialization and Daily Functioning: [$\chi^2(6) = 575.35, p < .001$]. $n = 1678$.

Note. Model: Risks: [$\chi^2(4) = 1110.43, p < .001$]. $n = 1678$. Interaction effect model: Risks [$\chi^2(6) = 1110.87, p < .001$]. $n = 1678$.

Note. Model: Wellness: $\chi^2(4) = 1451.19, p < .001$. $n = 1678$. Interaction effect model: Wellness [$\chi^2(6) = 1452.20, p < .001$]. $n = 1678$.

Race refers to two categories: Black individuals and White individuals. Ref=White (0).

Reference group for “youth” predictor is individuals age 19 and greater (0).

Housing Intervention Classification reference group = permanent supportive housing (3).

PP = predicted probability.

VI-SPDAT Subscale Scores, Housing Need Intervention Classification and Veteran Status

Multinomial regression analyses were performed to ascertain the effects of subscale scores, race, and veteran status on the likelihood that households would be prioritized for mainstream affordable housing or rapid rehousing vs. permanent supportive housing interventions. Three-way interaction models were also performed to examine if the relationship between the interaction terms of veteran status and subscale scores and housing intervention classification varied by race. The three-way interaction models were not significant therefore the data for these models is not presented. Instead, separate two-way interactions models were performed to examine if the relationship between subscale scores and housing intervention classification was moderated by veteran status. These models are presented instead of the three-way interaction models.

Model 1: History of Housing and Homelessness subscale: When controlling for veteran status, there was a significant main effect for History subscale. Those who scored higher on the History subscale had a lower probability of being classified for mainstream affordable housing ($b = -2.98$, $PP = .05$) and rapid rehousing ($b = -1.46$, $PP = .19$) vs. permanent supportive housing. There was not a significant main effect for veteran status.

Model 2: Socialization and Daily Functioning subscale: Interaction model: There was a significant interaction effect between Socialization and Daily Functioning subscale, veteran status, and housing intervention classification. ($b = -0.67$, $SE=0.34$, $p = .05$).

Figure 4.4 graphs the interaction showing the change in the predicted probability of being classified for a rapid re-housing intervention by veteran status and Socialization and Daily Functioning subscale score. Overall, the significant interaction suggests that the

relationship between being classified for rapid re-housing and Socialization and Daily Functioning subscale score varies by veteran status. The graph shows that there are no meaningful differences in the probability of being classified for rapid rehousing vs. permanent supportive housing for veterans vs. non-veterans for those that have a Socialization and Daily Functioning score of zero which means they indicated no debt or challenges with money management, no challenges with activities of daily living (ADLs), that their homelessness was not a result of unhealthy relationships, and that they engaged in activities that left them feeling happy or fulfilled. A low score on the Socialization and Daily Functioning subscale equals reporting one of the following, a medium score equates to reporting two of the following, a high score equates to reporting three of the following, and a very high score equates to reporting four of the following: debt or challenges with money management, challenges with ADLs, homelessness as a result of unhealthy relationships, or not engaging in meaningful relationships). For those who scored low, medium, or high on the Socialization and Daily Functioning subscale, veterans had a higher probability of being classified for rapid rehousing vs. permanent supportive housing. However, for those who scored very high on the Socialization and Daily Functioning subscale, non-veterans had a higher probability of being classified for rapid rehousing. Controlling for veteran status, there was also a significant main effect for Socialization and Daily Functioning subscale. Those who scored higher on the Socialization and Daily Functioning subscale had lower probability of being classified for mainstream affordable housing ($b = -2.56$, $PP = .07$) and rapid rehousing ($b = -1.10$, $PP = .25$) vs. permanent supportive housing. Controlling for Socialization and Daily Functioning subscale, there was a significant main effect for veteran status. Compared to

non-veterans, veterans had a higher probability of being classified for rapid rehousing ($b = 2.38, PP = .92$) vs. permanent supportive housing. Model 3: Risks subscale: Controlling for veteran status, there was a significant main effect for Risks subscale. Those who scored higher on the Risks subscale had a lower probability of being classified for mainstream affordable housing ($b = -3.50, PP = .03$) and rapid rehousing ($b = -1.81, PP = .14$) vs. permanent supportive housing. There were not significant main effects for race or veteran status. Model 4: Wellness subscale: Interaction model: There was a significant interaction effect between Wellness subscale, veteran status, and housing intervention classification ($b = 0.82, SE=0.49, p = .10$). Figure 4.5 graphs the interaction showing the change in the predicted probability of being classified for a mainstream affordable housing intervention by veteran status and Wellness subscale score. Overall, the significant interaction suggests that the relationship between being classified for mainstream affordable housing and Wellness subscale score varies by veteran status. The graph shows that there are no meaningful differences between veterans and non-veterans with the exception of those who score low-medium or medium. A low medium score indicates that a person reported two of the following and a score of medium indicates a person reported three of the following: physical health challenges or pregnancy, substance use that impacted their ability to obtain or maintain housing, mental health challenges including traumatic brain injury or developmental disability or other impairment that impacts their ability to live independently, tri-morbidity (reporting physical health, mental health, and substance use challenges), challenges with medication management, and homelessness as a result of abuse and trauma. For those that scored low-medium or medium veterans had a higher probability

of being classified for mainstream affordable housing vs. permanent supportive housing. Controlling for veteran status, there was also a significant main effect for Wellness subscale. Those who scored higher on the Wellness subscale had a lower probability of being classified for mainstream affordable housing ($b = -3.55$, $PP = .03$) and rapid rehousing ($b = -1.74$, $PP = .15$) vs. permanent supportive housing. There was not a significant main effect for veteran status alone.

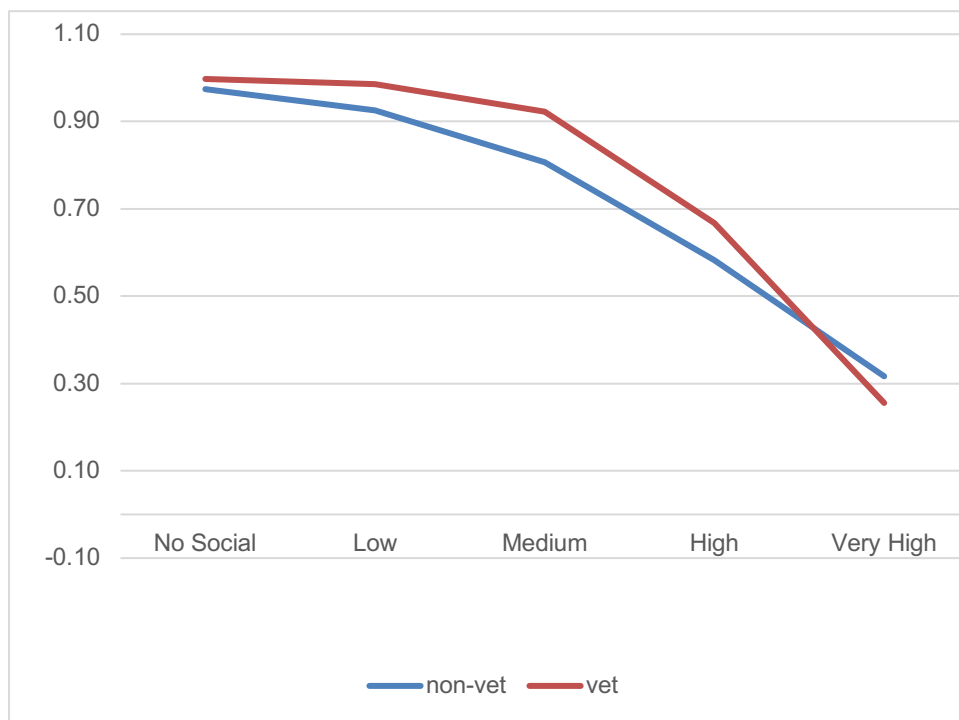


Figure 4.4: *Veteran Status, Socialization and Daily Functioning Subscale Score and Predicted Probability of Being Classified for Rapid Rehousing*

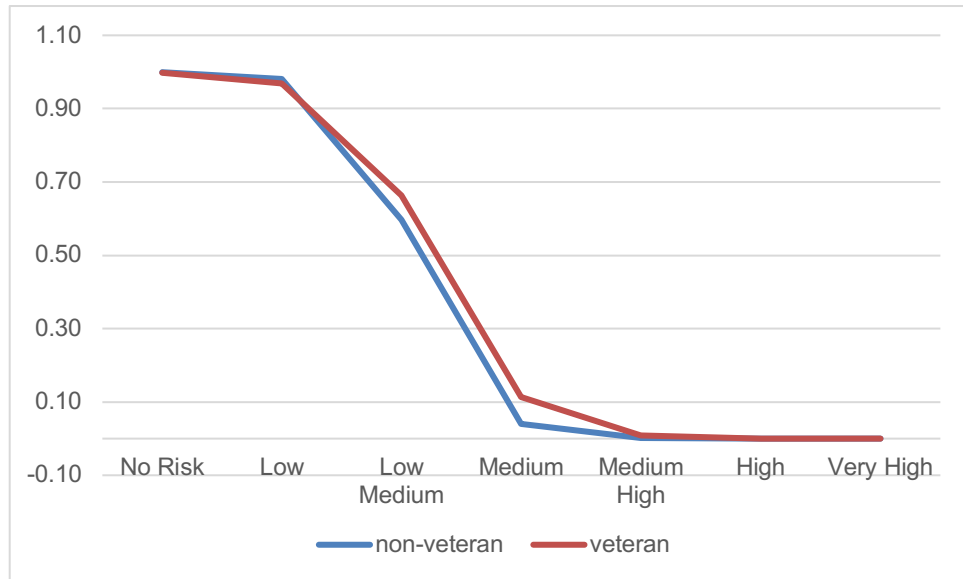


Figure 4.5: *Veteran Status, Wellness Subscale Score and Predicted Probability of Being Classified for Rapid Rehousing*

Table 4.22

Multinomial Regression: Housing Intervention Classification By VI-SPDAT Subscale and Veteran Status and Housing Intervention Classification and Subscale Score Moderated by Veteran Status (n = 1678)

Predictors	Main Effect Model						Interaction Effect Model					
	Mainstream Affordable Housing vs. Permanent Supportive Housing			Rapid Rehousing vs. Permanent Supportive Housing			Mainstream Affordable Housing vs. Permanent Supportive Housing			Rapid Rehousing vs. Permanent Supportive Housing		
	<i>b (se)</i>	<i>PP</i>	<i>p</i>	<i>b (se)</i>	<i>PP</i>	<i>p</i>	<i>b (se)</i>	<i>PP</i>	<i>p</i>	<i>b (se)</i>	<i>PP</i>	<i>p</i>
Model 1: History Subscale												
Intercept	3.30 (0.30)		<.001	3.13 (0.26)		<.001	3.32 (0.31)		<.001	3.06 (0.26)		<.001
History	-2.98 (0.19)	.05	<.001	-1.46 (0.14)	.19	<.001	-3.01 (0.20)	.05	<.001	-1.42 (0.14)	.19	<.001
Population: Veteran	0.16 (0.35)	.54	.66	0.30 (0.21)	.57	.15	0.43 (1.18)	.61	.72	1.30 (1.07)	.79	.23
Veteran X History							0.09 (0.70)	.52	.89	-0.56 (0.57)	.36	.32

Model 2: Socialization
and Daily Functioning
Subscale

Intercept	4.74 (0.31)		<.001	3.77 (0.23)		<.001	4.59 (0.32)		<.001	3.63 (0.24)		<.001
Social	-2.62 (0.15)	.07	<.001	-1.13 (0.08)	.24	<.001	-2.56 (0.15)	.07	<.001	-1.10 (0.08)	.25	<.001
Population: Veteran	0.04 (0.38)	.51	.92	0.33 (0.22)	.58	.14	2.25 (1.26)	.90	.07	2.38 (1.10)	.92	.03
Veteran X Social							-0.83 (0.56)	.30	.14	-0.67 (0.34)	.34	.05

Model 3: Risks
Subscale

Intercept	4.80 (0.29)		<.001	5.15 (0.27)		<.001	4.73 (0.30)		<.0001	5.07 (0.28)		<.001
Risks	-3.50 (0.18)	.03	<.001	-1.81 (0.10)	.14	<.001	-3.50 (0.18)	.03	<.001	-1.78 (0.10)	.14	<.001
Population: Veteran	-0.52 (0.41)	.37	.20	-0.25 (0.27)	.44	.35	0.45 (1.10)	.61	.68	0.76 (1.02)	.68	.46
Veteran X Risks							-0.34 (0.65)	.42	.60	-0.41 (0.40)	.40	.30

Model 4: Wellness

Subscale

Intercept	7.41 (0.38)		<.001	6.83 (0.34)		<.001	7.50 (0.40)		<.001	6.82 (0.36)		<.001
Wellness	-3.45 (0.16)	.03	<.001	-1.74 (0.09)	.15	<.001	-3.55 (0.17)	.03	<.001	-1.74 (0.09)	.15	<.001
Population: Veteran	-0.63 (0.43)	.35	.15	-0.35 (0.29)	.41	.23	-1.35 (1.30)	.21	.30	-0.23 (0.37)	.44	.85
Veteran X Wellness							0.82 (0.49)	.69	.10	-0.04 (0.34)	.49	.91

Note. Model: History: [$\chi^2(4) = 326.40, p < .001$]. $n = 1678$. Interaction effect model: History [$\chi^2(6) = 329.29, p < .001$]. $n = 1678$.

Note. Model: Socialization and Daily Functioning: $\chi^2(6) = 571.21, p < .001$. $n = 1678$. Interaction effect model: Socialization and Daily Functioning: [$\chi^2(8) = 576.98, p < .001$]. $n = 1678$.

Note. Model: Risks: [$\chi^2(6) = 1118.77, p < .001$]. $n = 1678$. Interaction effect model: Risks [$\chi^2(8) = 1109.99, p < .001$]. $n = 1678$.

Note. Model: Wellness: $\chi^2(6) = 1450.67, p < .001$. $n = 1678$. Interaction effect model: Wellness [$\chi^2(8) = 1455.54, p < .001$]. $n = 1678$.

Race refers to two categories: Black individuals and White individuals. Ref=White (0).

Reference group for “veteran status” predictor is non-veterans (0).

PP = predicted probability.

VI-SPDAT Subscale Scores, Housing Need Intervention Classification, and Domestic Violence

Multinomial regression analyses were performed to ascertain the effects of subscale scores, race, and experiencing domestic violence on the likelihood that households would be prioritized for mainstream affordable housing or rapid rehousing, vs. permanent supportive housing interventions. Three-way interaction models were also performed to examine if the relationship between the interaction terms of DV and subscale scores and housing intervention classification varied by race. The three-way interaction models were not significant therefore the data for these models is not presented. Instead, to examine if the relationship between subscale scores and housing intervention classification varied by DV, separate two-way interactions models were performed to examine if the relationship between subscale and housing intervention classification was moderated by DV. These models are presented instead of the three-way interaction models. Model 1: History of Housing and Homelessness subscale: Controlling for DV, there was a significant main effect for History subscale. Those who scored higher on the History subscale had a lower probability of being classified for mainstream affordable housing ($b = -3.10$, $PP = .04$) and rapid rehousing ($b = -1.47$, $PP = .19$) vs. permanent supportive housing. Controlling for History subscale, there was a significant main effect for DV. Compared to those who did not experience DV, those who experienced DV had a lower probability of being classified for mainstream affordable housing ($b = -1.75$, $PP = .15$) and rapid rehousing ($b = -0.32$, $PP = .42$). Model 2: Socialization and Daily Functioning subscale: Controlling for DV, there was a significant main effect for Socialization and Daily Functioning subscale. Those who scored higher

on the Socialization and Daily Functioning subscale had a lower probability of being classified for mainstream affordable housing ($b = -2.58, PP = .07$) and rapid rehousing ($b = -1.12, PP = .25$) vs. permanent supportive housing. Controlling for Socialization and Daily Functioning subscale, there was a significant main effect for DV. Compared to those who did not experience DV, those who experienced DV had a lower probability of being classified for mainstream affordable housing ($b = -1.14, PP = .24$) and rapid rehousing ($b = -0.17, PP = .46$). Model 3: Risks subscale: Controlling for DV, there was a significant main effect for Risks subscale. Those who scored higher on the Risks subscale had lower probability of being classified for mainstream affordable housing. ($b = -3.47, PP = .03$) and rapid rehousing ($b = -1.81, PP = .14$) vs. permanent supportive housing. There was not a significant main effect for DV status. Model 4: Wellness subscale: Controlling for DV, there was a significant main effect for Wellness subscale score. Those who scored higher on the Wellness subscale had lower probability of being classified for mainstream affordable housing ($b = -3.44, PP = .03$) and rapid rehousing ($b = -1.74, PP = .15$) vs. permanent supportive housing. Controlling Wellness subscale, there was a significant main effect for DV. Those who experienced DV had a lower probability of being classified for mainstream affordable housing ($b = -0.85, PP = .30$). As shown in Table 4.23, there is no evidence to suggest that domestic violence status moderates the relationship between History, Risks, and Wellness subscale scores, and housing intervention classification.

Table 4.23

Multinomial Regression: Housing Intervention Classification By VI-SPDAT Subscale and Domestic Violence Status and Housing Intervention Classification and Subscale Score Moderated by Domestic Violence (n = 1678)

Predictors	Main Effect Model						Interaction Effect Model					
	Mainstream Affordable Housing vs. Permanent Supportive Housing			Rapid Rehousing vs. Permanent Supportive Housing			Mainstream Affordable Housing vs. Permanent Supportive Housing			Rapid Rehousing vs. Permanent Supportive Housing		
	<i>b (se)</i>	<i>PP</i>	<i>p</i>	<i>b (se)</i>	<i>PP</i>	<i>p</i>	<i>b (se)</i>	<i>PP</i>	<i>p</i>	<i>b (se)</i>	<i>PP</i>	<i>p</i>
Model 1: History Subscale												
Intercept	3.65 (0.31)		<.001	3.24 (0.26)		<.001	3.61 (0.34)		<.001	3.21 (0.30)		<.001
History	-3.10 (0.20)	.04	<.001	-1.47 (0.14)	.19	<.001	-3.03 (0.21)	.05	<.001	-1.45 (0.14)	.19	<.001
Population: DV	-1.75 (0.35)	.15	<.001	-0.32 (0.14)	.42	.02	-1.61 (0.79)	.17	<.001	-0.18 (0.60)	.46	.04
DV X History							-0.10 (0.60) (0.86)	.48	.90	-0.08 (0.32)	.48	.81
Model 2: Socialization and Daily Functioning Subscale												

Intercept	4.82 (0.31)		<.001	3.83 (0.23)		<.001	4.81 (0.33)		<.001	3.81 (0.26)		<.001
Social	-2.58 (0.14)	.07	<.001	-1.12 (0.08)	.25	<.001	-2.57 (0.15)	.07	<.001	-1.12 (0.10)	.25	<.001
Population: DV	-1.14 (0.36)	.24	.001	-0.17 (0.14)	.46	.23	-1.03 (0.99)	.26	.30	-0.12 (0.57)	.47	.84
DV X Social							-0.05 (0.50)	.49	.92	-0.02 (0.19)	.49	.92
Model 3: Risks Subscale												
Intercept	4.78 (0.29)		<.001	5.08 (0.26)		<.001	4.70 (0.31)		<.001	5.01 (0.29)		<.001
Risks	-3.47 (0.18)	.03	<.001	-1.81 (0.10)	.14	<.001	-3.42 (0.19)	.03	<.001	-1.78 (0.11)	.14	<.001
Population: DV	-0.56 (0.38)	.36	.14	0.23 (0.17)	.56	.18	0.01 (0.84)	.50	.99	0.67 (0.73)	.66	.36
DV X Risks							-0.44 (0.61)	.60	.39	-0.16 (0.25)	.46	.53
Model 4: Wellness Subscale												
Intercept	7.40 (0.38)		<.001	6.76 (0.34)		<.001	7.43 (0.42)		<.001	6.75 (0.38)		<.001

Wellness	-3.44 (0.16)	.03	<.001	-1.74 (0.09)	.15	<.001	-3.47 (0.17)	.03	<.001	-1.73 (0.10)	.15	<.001
Population: DV	-0.86 (0.41)	.30	.04	0.12 (0.20)	.53	.55	-1.11 (0.99)	.25	.27	0.13 (0.85)	.53	.88
DV X Wellness							0.29 (0.46)	.57	.53	-0.004 (0.22)	.50	.99

Note. Model: History: [$\chi^2(4) = 357.24, p < .001$]. $n = 1678$. Interaction effect model: History [$\chi^2(6) = 357.30, p < .001$]. $n = 1678$.

Note. Model: Socialization and Daily Functioning: $\chi^2(4) = 580.42, p < .001$. $n = 1678$. Interaction effect model: Socialization and Daily Functioning: [$\chi^2(6) = 580.43, p < .001$]. $n = 1678$.

Note. Model: Risks: [$\chi^2(4) = 1114.67, p < .001$]. $n = 1678$. Interaction effect model: Risks [$\chi^2(6) = 1115.36, p < .001$]. $n = 1678$.

Note. Model: Wellness: $\chi^2(6) = 1457.11, p < .001$. $n = 1678$. Interaction effect model: Wellness [$\chi^2(6) = 1457.52, p < .001$]. $n = 1678$.

Race refers to two categories: Black individuals and White individuals. Ref=White (0).

Reference group for “domestic violence” predictor is no domestic violence (0)

PP = predicted probability

CHAPTER 5

SUMMARY, IMPLICATIONS, CONCLUSION

5.1 Overview of Project and Research Questions

This study extends research by the Center for Social Innovation and Thomas and colleagues (2020) by using data from the Charlotte-Mecklenburg Homeless Management Information System (HMIS) to conduct a race equity analysis of Charlotte-Mecklenburg program outcome and CoC VI-SPDAT data, overall and by sub-population. It replicates and extends national research within the local context of the Charlotte-Mecklenburg Continuum of Care by expanding the analysis to include both chronic and non-chronic populations and by using propensity score methods to examine the relationships between race, program outcome, and housing prioritization among sub-populations of individuals experiencing homelessness in Charlotte-Mecklenburg. The use of propensity score methods is novel as previous studies on this topic have almost exclusively used univariate, bivariate, and regression techniques. To date, no known studies have used this method to examine race effects on VI-SPDAT scores and homeless service system program outcomes. Propensity score methods allowed for the analysis of homelessness service system outcomes and VI-SPDAT data with balanced and comparable samples of persons experiencing homelessness using race as the “exposure”. These methods have the potential to provide a more accurate estimate of the influence of race on study outcomes by reducing the bias inherent in observational data and allowing the researcher to

examine race as an exposure independent of other confounding factors.. In this study, propensity score matching was used to create matched samples of Black individuals experiencing homelessness who had similar characteristics as White individuals experiencing homelessness to answer the following research questions:

1. According to Homeless Management Information System (HMIS) data, are there statistically significant racial differences (Black vs. White) in program outcome (exit to housing/ exit to homelessness)? Does this differ by sub-population status (unaccompanied youth age 18-24, veteran, domestic violence survivor, families with children)?
2. According to the Coordinated Entry assessment data, are there racial differences in overall VI-SPDAT scores among persons experiencing homelessness? Does this differ by sub-population status (unaccompanied youth age 18-24, veteran, domestic violence survivor)?
3. Are there racial differences in VI-SPDAT subscale scores: History of Housing and Homelessness, Risks, Socialization and Daily Function, Wellness? Does this differ by sub-population status (unaccompanied youth age 18-24, veteran, domestic violence survivor)?
4. What VI-SPDAT subscales predict overall housing need intervention classification? Does this differ by race? Does this differ by sub-population status (unaccompanied youth age 18-24, veteran, domestic violence survivor)?

This chapter includes a summary and discussion of major study findings, study limitations, implications for practice, and directions for future research.

5.2 Summary of Findings

This study found variation in program outcome, VI-SPDAT total score, and some VI-SPDAT subscale scores by race and sub-population membership. These variations may be related to resource access and to the unique lived experiences of people who identify as Black, unaccompanied youth, veterans, and survivors of domestic violence. This section describes factors that may be influencing the findings in this study by racial identity and sub-population membership.

The first research question examined Homeless Management Information System (HMIS) data to determine if there were racial differences in program outcome (exit to housing/ exit to homelessness) and if this differed by sub-population status (unaccompanied youth age 18-24, veteran, domestic violence survivor, families with children).

Racial Differences: Program Outcome

When examining race alone, results suggest that compared to White individuals, Black individuals were less likely to exit to a temporary destination vs. permanent destination and also less likely to exit to an institutional destination vs. a permanent destination. If the community's permanent housing subsidy resources are mostly administered based on VI-SPDAT scores and White individuals score higher on the VI-SPDAT then we would expect to see Black individuals exiting to permanent destinations less frequently than White individuals. Likewise, if we know that Black individuals are over-represented in the criminal justice system and Black people experiencing homelessness have even greater risk of engagement with the criminal justice system then we would expect Black individuals to exit to an institutional setting more frequently than

White individuals. Institutional destinations include Foster Care Home or Foster Care Group Home, Psychiatric hospital or other psychiatric facility, Substance abuse facility or detox center, Hospital or other non-residential non-psychiatric medical facility, Jail, prison, or juvenile detention center, Residential project or halfway house with no homeless criteria, and Long-term Care Facility or Nursing Home. The findings from this study are contradictory to the previously mentioned assumptions as Black individuals in this study were more likely to exit to permanent destinations than temporary or institutional destinations and White individuals were more likely to exit to temporary or institutional destinations. The exit destination categories used for this study align with the four categories HUD uses to group program exit destinations. However, as is illustrated by the description of institutional destinations above, there is wide within category variability for some of the HUD program outcome exit destination categories. Additional research is needed to examine individual exit destinations to understand racial differences more accurately in program exit destination and what factors might be influencing those differences. For example, exiting to stay with friends or family is considered a permanent destination by HUD. However, a 2022 unpublished analysis of local community data suggests that those who exit to friends and family are disproportionately Black females and that people who exit homelessness to friends and family return to homelessness at a higher rate than those who exit to other permanent destinations. It is possible that while Black people exit to permanent situations more frequently than White people that some exit destinations are more likely to remain permanent than others. Further, it is important to note that Psychiatric hospital or other psychiatric facility, Substance abuse facility or detox center, Hospital or other non-residential non-psychiatric medical facility, and

Long-term Care Facility or Nursing Home are included in the institutional destination category. As summarized in Priester and colleagues (2016), there are notable racial and ethnic disparities in access to care for persons with co-occurring mental health and substance use disorders. Oppression may contribute to differential referral rates and inaccurate, or under diagnosis of individuals who are racial/ethnic, minorities (Priester, 2016). These disparities may contribute to lower rates of exits to Psychiatric hospital or other psychiatric facility and substance abuse facility or detox center by Black individuals experiencing homelessness. Further, in a study of discrimination in America, 22% of African Americans reported they avoided accessing healthcare due to concerns of racial discrimination (NPR, 2017). Additionally, Black and Hispanic Medicare recipients report challenges accessing long-term care more frequently than White recipients (Ochieng et al., 2021). Conversely, flipping this argument, the higher likelihood that White individuals exit to institutional settings more frequently than Black individuals may highlight their increased access to physical and behavioral healthcare. Considering the institutional finding in particular, within the context of this study's conceptual model, this finding would support the conceptual model. That is, a structural environment, embedded with racism negatively impacts resource availability and access which might result in decreased access to the types of institutional care included in the HUD institutional destination category. Given the disparities in access to institutional destinations highlighted in this study and the high volume of Black persons exiting their homeless episode to family and friends, it is possible the findings in this study are skewed and do not actually indicate that Black individuals are more likely to exit to independent housing situations such as rental units with or without subsidy and/or wrap around supportive

services at higher rates than Whites.

Unaccompanied Youth: Program Outcome

When examining the effects of race and being an unaccompanied youth on the likelihood that households will exit homeless programs to a permanent destination versus temporary, institutional, or other destinations and controlling for youth, the findings were consistent with the race only model. When controlling for race, compared to non-youth (25 years or older), youth were less likely to exit to a temporary and less likely to exit to an other vs. permanent situation. These findings may reflect the nature of unaccompanied youth homelessness. Youth are less likely to enroll in traditional homeless services and utilize shelter and more likely to couch surf or find shelter in temporary housing situations (Morton, Dworsky, Samuels, 2017). Follow up interviews from the Voices of Youth National Survey found that 72% of youth surveyed (ages 13-25) who experienced literal homelessness, meaning they slept in a place not meant for habitation or in a shelter, also reported staying with others while unstably housed (Morton, Dworsky, Samuels, 2017). In addition, two Canadian studies analyzing youth shelter use suggest that the majority of youth shelter use could be classified as transitional meaning that they used shelter for short periods of time and infrequently (Jadidzadeh, & Kneebone, 2018, 2022). This decreased likelihood of shelter use may be influencing the decreased likelihood of youth exiting to a temporary destination.

With respect to the finding that youth are less likely to exit to other destinations vs. permanent housing destinations, it is important to note that HUD defines other destinations to include deceased, client doesn't know/ refused, worker could not

determine, data not collected, or other. HMIS end users are instructed to make every attempt not to select other as an exit destination due to the comprehensive nature of the exit destinations provided by HUD via the HMIS Data Standards. There are limited data on the age of people who die while experiencing homelessness and the age group data available does not align with the 18-24 years old age range associated with being an unaccompanied youth. However, one report suggests that more than half of the deaths of people experiencing homelessness occur among people who are 45 years of age or older with some major cities reporting the average age of death is between 43 and 54 years of age (Alameda County Health Care Services Agency, 2022; National Healthcare for the Homeless Council, Homeless Mortality Data Workgroup, 2021). These data suggest that the mortality rate for persons experiencing homelessness is lower for unaccompanied youth than older age groups. Given the small sample size of unaccompanied youth, it is likely there may not be any youth who exited the homeless services system to deceased or to destination other which would mean that those with an other destination would represent people whose exit destination was not available (for whatever reason) at the time of exit.

Unaccompanied youth are also less likely to meet the definition of chronic homelessness because they either do not meet the length of time homeless requirement or they don't present with a disability or both, yet CoCs are encouraged to prioritize CoC permanent supportive housing resources for persons experiencing chronic homelessness (United States Government Accountability Office, 2021). The Charlotte-Mecklenburg CoC prioritizes permanent supportive housing for persons experiencing chronic homelessness. This means that youth are less likely to meet the community prioritization

criteria and be prioritized for permanent supportive housing resources. Additionally, the CoC has extremely limited youth specific housing resources. Further, youth experiencing homelessness, particular youth of color and youth identifying as sexual or gender minorities, often couch surf (staying temporarily with family or friends or strangers; Curry, Morton, Matjasko, Dworsky, Samuels, & Schlueter, 2017; Petry, Hill, Milburn, & Rice, 2022; Suchting, Businelle, Hwang, Padhye, Yang, & Santa Maria, 2020). Given these factors, it is possible what is perceived as exiting to a permanent situation is actually couch surfing that is captured in the data set as permanently staying with family or friends.

Veteran Status: Program Outcome

When examining the effects of race and veteran status on the likelihood that households will exit homeless programs to a permanent destination versus temporary, institutional, or other destinations, findings suggest that veteran status moderates the association between race and exiting to a temporary housing destination vs. a permanent destination. Among White individuals, veterans have a greater probability of exiting to temporary vs. permanent housing compared to non-veterans. However, the relationship among Black individuals is opposite than it is for White individuals. Among Black individuals, veterans have a lower probability of exiting to temporary vs. permanent destination compared to non-veterans.

According to the 2022 Annual Homelessness Assessment Report (AHAR), the majority of veterans experiencing homelessness were White (58%). Thirty-one percent of homeless veterans identified as Black, African American, or African (AHAR, 2022). While the majority of homeless veterans are White, White veterans account for 76% of

all United States veterans which means they are under-represented in the homeless veteran population (AHAR, 2022). Conversely, those who identify as Black, African American, or African are over-represented as they account for 31% of homeless veterans yet only 12% of all United States veterans identify as Black (AHAR, 2022).

In general, veterans have more permanent housing resources at their disposal than non-veterans as they not only have access to community resources but also have potential to access veteran specific resources such as Veterans Affairs Supportive Housing (VASH) and Supportive Services for Veteran Families (SSVF). A review of SSVF data indicates that overall a higher percentage of Whites (46%) than Blacks (40%) are served by the SSVF program (Silverbush et. al, 2022). However, with Whites accounting for 58% of the overall homeless veteran population, these data do suggest that White veterans are not served by the SSVF program at a rate consistent with their representation in the population. Blacks are served by the SSVF program at a rate slightly higher than their prevalence in the homeless population (40% vs. 30%) which may be a factor in the finding that Black veterans are more likely to exit to permanent housing. Demographic data was not publicly available for the HUD-VASH program.

In addition to permanent housing resources, veterans also have access to veteran specific transitional housing (Grant Per Diem; GPD) and emergency sheltering resources (Contract Residential Services; CRS). These temporary housing solutions are both treatment-based with GPD focused on substance use and mental health treatment and CRS focused on psychosocial, medical, mental health, and substance use treatment (Department of Veterans Affairs, n.d.). As was previously discussed, 22% of African Americans reported they avoid accessing healthcare due to concerns of racial

discrimination (NPR, 2017). It is possible that Black veterans are less likely to access these treatment-based temporary housing solutions which is why we may see more Whites enrolling in these types of housing solutions. There was not demographic data publicly available for either the GPD or CRS programs. The Veterans Affairs Department should make annual race and ethnicity data available for all of their permanent and temporary housing programs both nationally and by CoC. This would allow CoCs to assess disparities in access to these resources and develop solutions to increase access if disparities do exist.

Domestic Violence: Program Outcome

When examining the effects of race and domestic violence on the likelihood that households will exit homeless programs to a permanent destination versus temporary, institutional, or other destinations and controlling for domestic violence, the findings were consistent with the race only model. Controlling for race, there was also a significant main effect for domestic violence. Compared to those without a history of domestic violence, those who reported experiencing domestic violence were less likely to exit to a temporary vs. permanent destination, less likely to exit to an institutional vs. permanent destination, and less likely to exit to an other vs. permanent destination.

In the local CoC, there are limited domestic violence specific shelter options for households fleeing DV. Due to the scarcity of resources, some DV shelters are time limited. When a person flees and enters a DV shelter, immediate needs often include recovering from the physical and emotional trauma of their abuse, addressing their legal and health and mental health needs, obtaining, or increasing income, and identifying post-shelter safe and affordable housing (Stylianou & Pich, 2021). Addressing these

needs within a time limited context is a tall order and many are unable to meet these objectives prior to their required exit from DV shelter (NNEDV, 2017, Sullivan & Virden, 2017). For many households, the inability to identify and obtain safe and affordable housing during their stay in a DV shelter results in an exit from the DV shelter into family homelessness shelters (Clark, Wood, & Sullivan, 2018; Stylianou & Hoge, 2020; Stylianou & Pich, 2021). In these cases, a household would exit to a temporary situation, however, these data indicate that the households in this sample are less likely to exit to temporary housing vs. permanent housing. There is some research that suggests that despite the challenges accessing safe and affordable housing post-shelter, DV survivors are able to exit DV shelters to permanent housing situations. In fact, two studies found that the majority of DV survivors exited shelter with DV transitional housing, unsubsidized or subsidized housing, or other housing in place (Stylianou & Pich, 2021; Ham-Rowbottom et al., 2005). Since 2018, HUD has included bonus funding specifically to fund housing solutions for domestic violence survivors in the CoC grant competition. Since then over \$200 million has been awarded to CoCs for DV survivor specific rapid rehousing, transitional housing, and coordinated entry. It is possible that these resources which not only provide housing resources but also resources to support coordinating housing resources across DV and homeless services systems may have impacted the number of exits to permanent housing for DV survivors. Finally, some DV survivors who are unable to identify safe and affordable housing and do not want to enter the homelessness sheltering system, return to their abuser because they see it as their only option for housing (Stylianou & Pich, 2021). Data on the number of persons who return to their abuser is inconsistent but some studies suggest that 50% of people who flee

return to their abuser (Hilbert & Hilbert, 1984; Schutte, Malouff & Doyle, 1988; Strube, 1988; Griffing et al., 2002). In the context of these data, returning to an abuser may look like exiting to a permanent housing situation because returning to family or friends or to the house where they lived with their abuser is considered exiting to permanent housing. Regardless of the type of permanent housing DV survivors exit to, homeless families with histories of domestic violence are more likely to experience episodic homelessness (Kim & Garcia, 2019). They face numerous barriers as they work toward long-term financial and housing independence and little is known about whether those who exited to permanent housing situations remained there long-term (Stylianou & Pich, 2021). Additional research is needed to examine the type of housing and rate at which DV survivors who exit to permanent housing retain their housing.

Research question 2-4 used HMIS Coordinated Entry assessment data to examine racial differences and differences by sub-population status (unaccompanied youth age 18-24, veteran, domestic violence survivor) among persons experiencing homelessness in overall VI-SPDAT scores, VI-SPDAT subscale scores, and whether VI-SPDAT subscale scores predicted overall housing need intervention classification.

Racial Differences: VI-SPDAT

When examining race alone, study results indicate that race significantly predicted VI-SPDAT total score. Specifically, Black individuals scored 0.50 points lower than White individuals on the VI-SPDAT total score. Using HMIS data, the Housing First Charlotte-Mecklenburg Evaluation Study examined data VI-SPDAT scores from individuals who were on the CoC's chronic homelessness by-name list during 2015-2018 by gender, race, age, ethnicity, and veteran status. The study found that BIPOC scores

were on average 1.1 points lower than White Individuals. These findings suggested that on average, White chronically homeless individuals scored higher on the VI-SPDAT total score than BIPOC in the Charlotte-Mecklenburg CoC and were consistent with findings from Wilkey et al., 2019. In the current study, while race significantly predicted VI-SPDAT total score, that matched sample indicates that compared to Whites, Blacks score 0.50 points lower on the VI-SPDAT total score. It is also important to note that race only explained 1% of the variation in VI-SPDAT total score. This suggests that there are many other factors that might be affecting a person's VI-SPDAT total score. In addition, the effect size was very small which suggests that race has a relatively weak influence on VI-SPDAT total score. When considering this finding in the context of previous research, it is important to note key differences in the Wilkey et. al (2019) and Thomas et. al, (2020). Both studies were conducted using samples consisting exclusively of persons experiencing chronic homelessness and individuals who are chronically homeless may be more medically vulnerable (and thus have higher overall scores) as having a verifiable disability is one of the criteria to meet the chronic homeless definition. This study used chronic homeless status as a matching covariate and individuals experiencing chronic homelessness made up approximately 50% of the study sample.

When examining race alone as a predictor of the VI-SPDAT subscale scores, it was found that race significantly predicted VI-SPDAT subscale score, Risk, with Black individuals in this sample scoring 0.18 points lower than White individuals on the VI-SPDAT Risk subscale. Race also significantly predicted VI-SPDAT subscale score, Wellness, with Black individuals scoring 0.30 points lower than White individuals on the VI-SPDAT Wellness subscale.

The Risks subscale consists of six questions that evaluate emergency services use interactions, risk for harm, legal issues, and risk for exploitation. Compared to non-Hispanic White persons, non-Hispanic Black persons are twice as likely to utilize the emergency department (ED), report using the ED as a source of primary healthcare, report arriving at the ED in an ambulance, and have higher rates of hospitalizations (Biello, Rawlings, Carroll-Scott, Browne, & Ickovics, 2010; CDC, 2016; Doty & Holmgreen, 2006; Hong, Baumann, & Boudreaux, 2007; Laditka, Laditka, & Mastanduno, 2003; Liu, Sayre, & Carleton, 1999; Parast, Matthews, Martino, Lehrman, Stark, & Elliot, 2022). With regard to crisis services, a recent study examining crisis hotline use in the United States in the previous 12 months found that Blacks were significantly less likely to use crisis hotlines (Roth & Szlyk, 2021). In relation to engagement with law enforcement or incarceration, more than 60% of the two million people currently incarcerated are persons of color with Black men and women six times more likely to be incarcerated than their White counterparts (Bonczar, 2003; The Sentencing Project, 2018). With regard to exploitation, there is limited research on racial differences in engaging in survival sex among individuals experiencing homelessness but one study of homeless youth age 10-25 years found that African American persons are 2.2 times more likely to engage in survival sex than White persons (Wall & Bell, 2011). Additionally, multiple studies have illustrated that Black individuals are more likely than White individuals to be violently victimized (Morgan & Thompson, 2021; Thompson & Tapp, 2022; Like-Haislip & Miofsky, 2011). Finally, Semenza, Testa, & Jackson (2022) suggest that racism plays a role in this disparity due to intersectional disadvantage for Black women and racist stereotypes related to the criminal nature of Black men (Berg,

2014). This research suggests that individuals who identify as Black are more likely to endorse the Risk subscale items that report risk of harm (hurting oneself or others; being physically victimized), legal issues (current or historic that could impact access to housing), and risk for exploitation (engaging in risky sexual or drug behavior for survival purposes). Black individuals are less likely to endorse one of the six types of experiences listed in the section on emergency service use (using crisis services) but more likely to report ED usage, taking an ambulance to the hospital, engaging with the police, inpatient hospitalizations, or a short-term stay in jail or prison. Individuals must endorse a total of four types of emergency service use to receive one point for the section. However, a similar study using HMIS data by Cronley (2020) found that White persons more frequently reported using EDs, ambulance services, and inpatient services and were more likely to report being attacked while homeless or having tricked during their homelessness. These findings suggest that it is possible that these factors may be influencing lower scores on the Risk subscale by Black individuals. In addition, given the stigma associated with many of the activities queried in the Risks subscale, it is possible that the responses are subject to response bias.

The Wellness subscale evaluates physical health such as chronic health issues, physical disabilities and healthcare access; substance use such as negative consequences related to housing as a result of substance use, mental health such as developmental or learning disabilities or mental health challenges that impact one's ability to live independently; tri-morbidity: the presence of physical health, substance use, and mental health challenges; medication management and adherence; and abuse and trauma and its subsequent impact on the current period of homelessness. For the Wellness scale, the

sub-sections of physical health, mental health, tri-morbidity, and medications assume that individuals access healthcare in such a manner that they would be aware of specific diagnoses, have insight into their physical or mental health challenges, and receive ongoing care that would involve the prescription of medication. However, Black individuals do not access healthcare at the same rate as White individuals for a variety of reasons including distrust of the healthcare system, concerns of implicit and explicit racial discrimination by health care providers, and in the case of mental health care, social stigma (Armstrong-Mensah, Patel, Parekh, & Lee, 2020; Gillispie-Bell, 2021; NPR, 2017). In addition, Cronley (2020) found that White people were one and a half times more likely to report homelessness due to trauma. These overall differences in access to care and reason for homelessness may be influencing the lower score we see among Black individuals for Wellness subscale score.

When examining whether VI-SPDAT subscales predicted overall housing need intervention, those who scored higher on the History of Housing and Homelessness, Risks, Socialization and Daily Function, and Wellness subscales were less likely to be classified for mainstream affordable housing vs. permanent supportive housing and were less likely to be classified for rapid rehousing vs. permanent supportive housing. These findings are consistent with what we would expect to see. Lower subscale scores would likely result in lower overall VI-SPDAT scores and lower VI-SPDAT scores are associated with being classified for mainstream affordable housing and rapid rehousing.

When examining if VI-SPDAT subscales moderated the relationship between race and housing intervention classification there was a significant interaction effect between race, History subscale, and housing intervention classification. Overall, the significant

interaction suggests that the relationship between being classified for rapid re-housing and History subscale score varies by race. There were no meaningful racial differences in the probability of being classified for rapid rehousing vs. a permanent supportive housing for those who have no history score (a score of zero) or those that have a low history (a score of one). There was a difference between Black and White individuals who scored high history on the History subscale (a score of two). Black individuals who score high on the History subscale had a higher probability of being classified for rapid rehousing compared to White individuals who scored high on the History subscale. Despite having similar responses and identical scores on the History subscale, Black individuals were more likely to be classified for mainstream and rapid rehousing vs. permanent supportive housing which suggests even though homeless histories are similar, White individuals score higher overall which results in them more frequently being classified for permanent supportive housing.

There was also a significant interaction effect between race, Risks subscale, and housing intervention classification. Overall, the significant interaction suggests that the relationship between being classified for rapid rehousing and Risks subscale score varies by race. There were no meaningful differences in the probability of being classified for rapid rehousing vs. permanent supportive housing for Black vs. White individuals with the exception of those who score low-medium on the Risks subscale or a score of 2. For those who scored low-medium, Black individuals had a higher probability of being classified for rapid rehousing vs. permanent supportive housing than White individuals who also scored low-medium. As was seen with the History subscale, despite each endorsing two types of Risks and having identical scores on the Risks subscale, Black

individuals were more likely to be classified for rapid rehousing vs. permanent supportive housing which suggests even though both report similar levels of Risk, White individuals score higher overall which results in them more frequently being classified for permanent supportive housing. Individual item analysis for the Risks subscale would facilitate a better understanding of which specific types of Risks are related to an overall higher VI-SPDAT total score and if that relationship varies by race.

The examination of racial differences in VI-SPDAT overall and subscale score in this study suggests that vulnerability as defined via this study's conceptual model is not completely captured by the VI-SPDAT. The literature suggests that Black and White individuals have similar patterns of behavior in relation to Risks and Wellness yet White individuals score higher overall on these subscales and on the overall VI-SPDAT. This suggest that there is a factor or factors that are not being captured via the tool that are influencing the overall vulnerability score. Perhaps it is not the resource access behavior but the quality of the resources being accessed, implicit and explicit racism in the way resources are administered, and the compounded relative risk based on exposure to racism that is missing from the measure. If the structural environment, relative risk, and resource availability interact to produce increased vulnerability among people that identify as Black then measures are needed that quantify the impact of a racist structural environment, and measure resource availability and relative risk for poor biological, psychological, and social outcomes.

Unaccompanied Youth: VI-SPDAT

When controlling for race, being an unaccompanied youth was a significant predictor of VI-SPDAT total score. Youth scored 2.20 points lower than non-youth on

the VI-SPDAT total score. This is consistent with prior research by Winetrobe and colleagues (2016) who found that youth had lower scores than non-youth on the single adult VI-SPDAT because they typically do not have the types of health vulnerabilities or risk for mortality which is assessed by the VI-SPDAT (OrgCode, 2015). These differences in risk for mortality and health risks are likely why we see unaccompanied youth in this sample scoring 2.20 points lower than non-youth. In this sample, there were significant differences between youth and non-youth on not only the overall VI-SPDAT score but also the History, Risks, and Wellness subscales. In addition compared to non-youth, youth had a shorter length of time homeless. Because measures of vulnerability for adult homelessness have focused almost exclusively on factors related to service and system cost and premature mortality, the Transitioning Age Youth (TAY) triage tool and the Next Step Tools (NST) were developed (Hwang et al., 1998; Juneau Economic Development Council, 2009; Swanborough, 2011; Economic Roundtable, 2011; Rice, 2018; OrgCode, 2015). The TAY triage tool was developed to assess if youth are likely to experience long-term homelessness rather than assesses system cost and mortality risk (Rice et. al., 2018). In 2015, the TAY was integrated with the NST, an adaptation of the VI-SPDAT, to create the TAY-VI-SPDAT (OrgCode, 2015). The TAY-VI-SPDAT focuses on the experiences, vulnerabilities, and needs of transitioning age youth (Rice, 2017; Rice et. al., 2018; OrgCode, 2015).

When examining if being an unaccompanied youth predicted VI-SPDAT subscale scores, there were significant main effects for History, Risks, and Wellness subscales. Controlling for race, youth scored 0.32 points lower on the History subscale, 0.56 points lower on the Risks subscale, and 0.83 points lower on the Wellness subscale compared to

non-youth. The History subscale queries whether a person sleeps most frequently in shelter, transitional housing, or a safe haven and whether they have been homeless for 12 consecutive months or four times in three years. The nature of the way unaccompanied youth experience homelessness impacts the likelihood that unaccompanied youth would respond affirmatively to either History question. As has already been mentioned, unaccompanied youth experiencing homelessness often couch surf or stay with others and report staying in shelter for very short periods of time and infrequently (Jadidzadeh & Kneebone, 2018, 2022; Morton, Dworsky, Samuels, 2017). This may be influencing youth's lower score on the History subscale compared to non-youth. With respect to Risk, unaccompanied homeless youth do report experiencing both sexual and labor exploitation and have increased likelihood of being arrested or having contact with the criminal justice system (Almquist & Walker, 2022; Mostajabian, Santa Maria, Wiemann, Newlin, & Bocchini, 2019; Murphy, 2017). Homeless youth are also often uninsured and rely on emergency department use for medical care, are less likely to seek care until the need is urgent and have increased odds of poor healthcare access compared to their non-homeless peers (Heathcote, Rosenthal, Ricondo, Hergenroeder, & Wienmann, 2021; Nam, Palmer, & Patel, 2021). Further, one study using a nationally representative sample found that in 27% of ED visits by homeless youth, the youth arrive at the ED by ambulance (Nam, Palmer, & Patel, 2021). Homeless youth often lack access to transportation which also influences their use of ambulances to be able to access care (Nam, Palmer, & Patel, 2021). In relation to use of crisis services, research also has shown crisis and suicide prevention hotlines have low usage by youth (Gould, Greenberg, Munfakh, Kleinmann, Lubell, 2006). Together this research suggests that unaccompanied

youth are more likely to endorse the Risk subscale items that report risk of harm (hurting oneself or others; being physically victimized), legal issues (current or historic that could impact access to housing), and risk for exploitation (engaging in risky sexual or drug behavior for survival purposes). However, unaccompanied youth are less likely to endorse two of the six types of experiences listed in the section on emergency service use (being hospitalized, using crisis services) but more likely to report ED usage, taking an ambulance to the hospital, engaging with the police, or a short-term stay in jail or prison. It is possible the decreased likelihood of reporting being hospitalized or engaging with crisis services is influencing the total score for the Risk subscale. For the Wellness scale, the sub-sections of physical health, mental health, tri-morbidity, and medications assume that individuals access healthcare and receive ongoing care that would involve the prescription of medication. However, youth often use the emergency department for medical care and do not access care until the need is urgent (Heathcote, Rosenthal, Ricondo, Hergenroeder, & Wienmann, 2021; Nam, Palmer, & Patel, 2021). Homeless youth do report higher rates of trauma prior to homelessness and greater risk for victimization once homeless (Edidin, Ganum, Hunter, & Karnick, 2012; Whitbeck & Hoyt, 1999). They also have higher rates of substance use and mental health symptoms compared to their housed counterparts (Edidin et al., 2012; Medlow, Klineberg, & Steinbeck, 2014). One key factor in the Wellness section that may be impacting how an unaccompanied youth responds to the sub-sections of the sub-scale is that for the substance use and mental health sections, the questions are ask in relation to whether or not the person has lost housing or has had challenges maintaining housing due to their substance use and mental health challenges. It is possible that some unaccompanied

youths have not lived independently or in housing that they viewed as their own which may impact how they respond to these questions and ultimately impact their score on the Wellness subscale.

When examining the effects of subscale scores, race, and being an unaccompanied youth on the likelihood that households would be prioritized for mainstream affordable housing or rapid rehousing vs. permanent supportive housing interventions, when controlling for Socialization and Daily Functioning subscale there was a significant main effect for unaccompanied youth. Compared to non-youth, youth had a higher probability of being classified for mainstream affordable housing vs. permanent supportive housing. This study found that on average unaccompanied youth score 2.20 points lower on the VI-SPDAT than their non-youth counterparts. Given that unaccompanied youth generally score lower on the VI-SPDAT total score and lower scores are associated with being classified for mainstream housing, this finding is consistent with what we would expect to see.

This study confirmed what was already known about youth homelessness. Youth experience homelessness in different ways than non-youth, have different resource access behavior, and may have less access to resources due to their age. In addition, they may have increased relative risk due to the characteristics of their structural environment (e.g. family-related trauma and rejection, foster care involvement, etc.). Youth rarely meet the criteria to be prioritized for permanent supportive housing which per HUD should be dedicated to persons who meet the chronic homeless criteria. Youth specific permanent supportive housing resources that do not require chronicity are needed for unaccompanied youth experiencing homelessness.

Veteran Status: VI-SPDAT

When controlling for race, veterans scored .90 points lower than non-veterans on the VI-SPDAT total score . Veterans in this sample were slightly older than the mean age (54 years vs. 48 years) and when compared to non-veterans, had significantly lower scores on Risk and Wellness subscale scores. As has been previously mentioned, the VI-SPDAT assesses for service use, health vulnerabilities, and risk for mortality. For veterans, the same factors which put them at risk for homelessness also put them at risk for accelerated aging and reduced life span (Schinka & Byrne, 2018). A systematic review of studies examining risk factors for homeless veterans identified substance use, mental health, income-related factors, and lack of social support as potential risk factors for veteran homelessness (Tsai & Rosenheck, 2014). Additional risk factors include childhood trauma, military sexual trauma, exposure to combat stress, chronic health conditions, medical comorbidities, low educational attainment, criminal justice involvement, and family separation (Levitt, 2015; Perl, 2011; Schinka & Byrne, 2018; USICH, 2018).

For veterans, although the effect sizes were small, there were significant relationships between race, veteran status and Risks and Wellness subscales. When controlling for race, compared to non-veterans, veterans scored 0.37 points lower on the Risks subscale and 0.53 points lower on the Wellness subscale. Tsai and colleagues (2013) developed risk profiles for homeless veterans using a national representative sample of 120,000 veterans. They found that among homeless veterans, there are four risk classes: relatively few problems, dual diagnosis, poverty, substance abuse and incarceration and disabling medical problems (Tsai et. al., 2013). The dual-diagnosis

group was comprised of the veterans who had the highest prevalence of psychiatric hospitalizations, psychiatric disorders, and psychiatric hospitalizations (Tsai et. al., 2013). The disabling medical problems group had the highest prevalence of one or more chronic medical conditions, tended to be older, and often reported being unemployed with no recent employment (Tsai et. al, 2013). These typologies suggest that some veterans would positively endorse being hospitalized, having physical and mental health challenges, and challenges related to substance use. In addition, despite access to Veterans Affairs healthcare, homeless veterans utilize EDs at four times the rate of non-homeless veterans while the general population is three times more likely to use the ED compared to the general population (Tsai, Doran, & Rosenheck, 2013; Sun, Karaca, & Wong, 2018). Homeless veterans also have higher rates of HIV than housed veterans and the general population (Noska, Belperio, Loomis, O'Toole, & Backus, 2017). While the overall prevalence of HIV among homeless veterans is unclear, one study of Department of Veterans Affairs (VA) Corporate Warehouse Data from 2015 found that prevalence of HIV among homeless veterans utilizing VA services to be 1.52% compared to 0.44% for non-homeless veterans and 3.3% for the general homeless population (Noska, Belperio, Loomis, O'Toole, & Backus, 2017). This suggests veterans may be less likely to endorse HIV than non-veterans (Noska, Belperio, Loomis, O'Toole, & Backus, 2017; Thakrar, Morgan, Gaeta, Hohl, & Drainoni, 2016). In relation to medication management, there is some research that suggests veterans who are engaged in long-term opioid therapy or chronic non-cancer pain patients may be more likely to display medication misuse behavior (Baria, Pangarkar, Abrams, & Miaskowski, 2019). However, with such limited research using very narrow sample parameters, it is impossible to say if veterans would

be more or less likely to engage in medication misuse behaviors. Information was also not available on homeless veterans' use of crisis services or ambulances so it is unclear if homeless veterans utilize crisis services or ambulance services at rates similar to homeless non-veterans. There is also limited veteran specific information about the exploitation and recent trauma and abuse experiences of veterans experiencing homelessness. One research study does suggest that homeless veterans are at risk for financial exploitation particularly in relation to receiving backpay for military financial benefits and Social Security disability, however no studies were identified that indicate homeless veterans likelihood of being a victim of sexual or labor exploitation (Sipe, 2021). In relation to abuse and trauma, Dinnen and colleagues (2014) suggest that generally persons experiencing homelessness have trauma histories and different sub-populations of homeless veterans are more likely to experience specific types of trauma such as post-traumatic stress disorder (PTSD), traumatic brain injury (TBI) and military sexual trauma (MST), however no studies were found that compare the prevalence of homelessness precipitating trauma between veterans and non-veterans (Washington, Yano, McGuire, Hines, Lee, & Gelberg, 2010). Finally, a literature review on homeless veterans found that recent or current criminal justice involvement was reported at rates ranging from three to 41% (Benda, Rodell, & Rodell, 2003a, 2003b; Kashner et al., 2002). Given this information, it is possible that homeless veterans behavior in relation to ambulance and crisis service use, risk for harm, and risk for exploitation may be impacting the overall score on Risks subscale. Likewise, it is possible that veterans' homelessness precipitating trauma and abuse experiences or lower rates of HIV compared to the overall homeless population is influencing homeless veterans overall Wellness score.

However, it is impossible to draw these conclusions without additional information and analysis.

The effects of subscale scores, race, and veteran status on the likelihood that households would be prioritized for mainstream affordable housing or rapid rehousing vs. permanent supportive housing interventions was examined. There was a significant interaction effect between Socialization and Daily Functioning subscale, veteran status, and housing intervention classification. The significant interaction suggests that the relationship between being classified for rapid re-housing and Socialization and Daily Functioning subscale score varies by veteran status. For those who scored low (score of one), medium (score of two), or high (score of three) on the Socialization and Daily Functioning subscale, veterans had a higher probability of being classified for rapid rehousing vs. permanent supportive housing. However, for those who scored very high (score of four) on the Socialization and Daily Functioning subscale, non-veterans had a higher probability of being classified for rapid rehousing. The Socialization and Daily Functioning section has five questions. Two questions are related to money management; one question assesses for meaningful daily activity; one assesses for proficiency in completing activities of daily living (ADLs); and one inquires if their homelessness is related to the breakdown of a social relationship (including abuse). An individual is scored one point each if they report challenges with ADLs, that they do not have planned activities that make them feel fulfilled or happy, that their homelessness is a result of a relationship breakdown including an unhealthy or abusive relationship. To be scored a point for money management, a person had to report they either owed money to any person or government entity or that they did not have any income. Veterans who

endorsed up to three of the domains within the Socialization and Daily Functioning subscale were more likely to be classified for rapid rehousing but non-veterans who endorsed all four were more likely to be classified for rapid rehousing. One study examining geriatric conditions in formerly homeless adult enrolled in permanent supportive housing (PSH programs) found that 42% of their sample reported challenges with ADLs with a 10% decrease in likelihood of reporting ADL challenges for each year they spent in PSH (Henwood, Lahey, Rhoades, Pitts, Pynoos, & Brown, 2019). Permanent supportive housing is targeted toward individuals with the most severe housing and service needs. However, in the case of the VI-SPDAT an individual is only scored one point for being unable to complete one's ADLs (a state that suggests an individual may not be able to care for themselves without support). Non-veterans who endorsed all four domains within the Socialization and Daily Functioning would have endorsed that they experienced challenges with ADLs. Similarly for veterans, it is possible those who scored one, two, or three also may have endorsed the item that they had challenges with their ADLs. This suggests the need for more intensive supportive services, yet both groups had higher probability of being classified for the rapid rehousing intervention instead of the permanent supportive housing intervention. This begs the question why a factor that indicates a clearly elevated service need only accounts for one point of the total VI-SPDAT score and why individuals who endorse it are at an increased likelihood of being classified as rapid rehousing, a less service intensive intervention.

There was also a significant interaction effect between Wellness subscale and veteran status. Overall, the significant interaction suggests that the relationship between

being classified for mainstream affordable housing and Wellness subscale score varies by veteran status. For those that scored low-medium or medium veterans had a higher probability of being classified for mainstream affordable housing vs. permanent supportive housing. There are six possible points for the Wellness subscale with four of the points being associated with physical, mental, and behavioral health and tri-morbidity. A score of two or three would suggest a lack of tri-morbidity (as an individual would have to also report physical, mental, and behavioral health challenges in order to meet the criteria for tri-morbidity). Therefore, it is possible that veterans who score two or three are not reporting tri-morbidity which suggests with regard to health they are less vulnerable overall which would result in a mainstream affordable housing need classification.

Domestic Violence: VI-SPDAT

When controlling for race, individuals who reported experiencing DV scored 1.21 points higher on the VI-SPDAT total scores than those who reported no DV. Individuals who experienced DV also had significantly higher overall VI-SPDAT scores, higher scores on the Risks, Wellness, and Socialization and Daily Functioning subscales, are younger, and have shorter lengths of time homeless. It is also important to note that nine percent of veterans and 18% of unaccompanied youth also reported DV. Brown and colleagues (2018) examined the reliability and validity of the VI-SPDAT and found that the Socialization and Daily Functioning domain exhibited poor reliability. McCauley and Reid (2020) suggest that this poor reliability indicates that the VI-SPDAT may not accurately assess the vulnerability of intimate partner violence survivors. This domain asks the question “Is your current homelessness in any way caused by a relationship that

broke down, an unhealthy or abusive relationship, or because family or friends caused you to become evicted?”. Cronley (2020) suggest that survivors experience discomfort when answering this question about potential abuse, unhealthy relationships, and their current homelessness episode. This discomfort impacts the accuracy of the tool and its ability to measure vulnerability among survivors (Cronley, 2020). The current study did not examine individual item responses so for this particular sample, it is impossible to determine if persons who report being a survivor of DV answered the above question in a significantly different way than those who did not experience DV. However, in this sample, those who experienced DV scored significantly higher on the Socialization and Daily Functioning subscale. The maximum score on the subscale is four and the mean score for those who experienced DV was 2.73 with a standard deviation of 0.90. For domestic violence, although the effect sizes were small, there were significant relationships between race, domestic violence status and Socialization and Daily Functioning, Risks, and Wellness subscales. When controlling for race, compared to those who did not experience domestic violence, those who did experience domestic violence scored 0.21 points higher on the Socialization and Daily Functioning subscale, 0.49 points higher on the Risks subscale, and 0.56 points higher on the Wellness subscale. There are five questions in the Socialization and Daily functioning section. Two relate to money management; one assesses for meaningful daily activity; one assesses for ability to complete activities of daily living; and one inquires about their current episode of homelessness, unhealthy relationships, and abuse. Given the high mean score and low mean age, it is possible that it is unlikely that persons who are survivors of DV in the sample have challenges related to completing their ADLs. If this is true then it is possible

those who experience DV do respond affirmatively to the homelessness, unhealthy relationships, and abuse question which is contrary to previous suppositions about the Socialization and Daily Functioning subscale. It has been suggested that the VI-SPDAT may not accurately assess the vulnerability of DV survivors because it does not capture risk factors for homelessness related to DV (MaCauley & Reid, 2020). However, in this sample, those who experienced DV score 1.21 points higher than those who did not experience DV which suggests that while the VI-SPDAT may not completely assess vulnerabilities specific to this population, the vulnerabilities evaluated by the VI-SPDAT are experienced by the persons experiencing DV in this sample.

The Wellness subscale evaluates physical health such as chronic health issues, physical disabilities and healthcare access; substance use such as negative consequences related to housing as a result of substance use, mental health such as developmental or learning disabilities or mental health challenges that impact one's ability to live independently; tri-morbidity: the presence of physical health, substance use, and mental health challenges; medication management and adherence; and abuse and trauma and its subsequent impact on the current period of homelessness. Compared to those who did not experience DV, those who did scored 0.56 higher on the Wellness subscale. A review of the literature on intimate partner violence (IPV) and physical and mental health outcomes found that experiencing intimate partner violence has been associated with poorer mental health, psychopathology, and negative behavior patterns (Priester, Cole, Lynch, & DeHart, 2016). Specific mental health problems found to be related to IPV are survivor depression, post-traumatic stress disorder (PTSD), anxiety, self-harm, and suicide risk, and eating disorders (Priester, Cole, Lynch, & DeHart, 2016; Dillon, Hussain, Loxton, &

Rahman, 2013). In addition, across multiple studies, compared to those who did not experience IPV, those who did had lower mental health and social functioning scores on measures of generalized mental health and functioning (Dillon, Hussain, Loxton, & Rahman, 2013). There is also significant evidence linking IPV experiences and substance use and/or substance use disorders (Priester, Cole, Lynch, & DeHart, 2016). Finally, IPV has been found to have extensive effects on physical health including via direct or indirect injuries (Priester, Cole, Lynch, & DeHart, 2016). Coker and colleagues have also suggested IPV is associated with health consequences and chronic health conditions including nervous system, respiratory, and disorders such as nerve damage, chronic back or joint pain, nerve damage, heart problems, circulatory disease, asthma, and emphysema (Coker, Smith, & Fadden, 2005; Coker et al., 2000, 2002). The research on IPV and medication adherence has mostly been focused on persons who experienced IPV and are HIV-positive; findings from that body of literature suggest that medication adherence is lower among person who report being survivors of IPV (Llenas et. al, 2022; Lopez, Jones, Villar-Loubet, Arheart, & Weiss, 2010). One small Canadian study did examine patterns of medication use among women who reporting experiencing IPV and found in their sample, those who reported IPV were more likely to report taking anxiolytics, inhalants, and antidepressants and less likely to be taking over the counter pain medicine (Wuest, Varcoe, Merritt-Gray, Connors, Lent, & Ford-Gilboe, 2007). In a similar Canadian study, using a related dataset, 16% of persons reporting IPV and chronic pain also reported using higher than their recommended dosage of pain medicine (Wuest, Merritt-Gray, Ford-Gilboe, Lent, Varcoe, & Campbell, 2008). Together these research findings suggest that persons who have experienced DV may have increased likelihood to

endorse items in each sub-section of the Wellness subscale.

When examining the effects of subscale scores, race, and experiencing domestic violence (DV) on the likelihood that households would be prioritized for mainstream affordable housing or rapid rehousing, vs. permanent supportive housing interventions. Controlling for History subscale, there was a significant main effect for DV. Compared to those who did not experience DV, those who experienced DV had a lower probability of being classified for mainstream affordable housing and rapid rehousing. Controlling for Socialization and Daily Functioning subscale, there was a significant main effect for DV. Compared to those who did not experience DV, those who experienced DV had a lower probability of being classified for mainstream affordable housing and rapid rehousing. Controlling Wellness subscale, there was a significant main effect for DV. Those who experienced DV had a lower probability of being classified for mainstream affordable housing. These findings suggest that while History, Socialization and Daily Functioning, and Wellness subscale scores are related to whether a person is classified for mainstream affordable or rapid rehousing vs. permanent supportive housing, experience of DV increases the likelihood that a person is classified for permanent supportive housing vs. mainstream affordable or rapid rehousing.

Summary

By reconceptualizing vulnerability as risk for poor physical, psychological, and social health as a result of resource availability and access, relative risk, and the influence of the structural environment, and measuring these factors when assessing for vulnerability, we move away from biased constructs of vulnerability such medical vulnerability (which is healthcare resource access dependent) and White norms of socio-

economic and psychosocial risk factors. When considering the structural environment, it is important to consider not only the influence of institutionalized White advantage on risk and resource availability but also population specific structural environment factors and how heteronormative advantage influences risk and resource availability for people with diverse gender and sexual identities. Further, it is necessary to consider the intersection of the structural environment, an individual's varying identities, and how structural environment and identity interact to exacerbate or mitigate an individual's overall vulnerability. Finally, it is important to center the experience of the people represented in these data in any conceptualization of the structural environment and population specific protective and risk factors to ensure unique experiences are quantified and conceptualized by the lived experiences of people experiencing homelessness.

5.3 Limitations

The current study contributed to an understanding of how program outcomes, Vulnerability Index Service Prioritization Decision Assistance Tool (VI-SPDAT) total score and subscale scores, and housing intervention classification vary by race and sub-population status. This study has several limitations. First, the data is limited to persons who came in contact with contributing homeless organizations who enter data in the HMIS system in Charlotte-Mecklenburg. These administrative data can only be used to describe persons using homeless services at HMIS contributing organizations in the Charlotte-Mecklenburg geographic data. While the HMIS system does capture data on a significant number of persons experiencing homelessness in the Charlotte-Mecklenburg area, the sample does not represent all persons experiencing homelessness. Second, the data do not represent all persons who experienced homelessness during the study period.

Data collection approaches changed during the study period multiple times. For the majority of the study period, the VI-SPDAT Individual and VI-SPDAT Families was only administered to persons experiencing chronic homelessness. While the VI-SPDAT Individual has consistently been administered at the time of Coordinated Entry assessment, there was a period of time that the VI-SPDAT Families was only administered 14 days or more post shelter entry. In late 2020, both tools began being administered to all people experiencing literal homelessness at the time of Coordinated Entry initial assessment or assessment update. Despite these differences in who the tool was administered to or when the tool was administered, the use of propensity scores matching works to mitigate these limitations with the creation of matched samples. These data are also potentially subject to risk for measurement error. It is possible that data were incorrectly entered at the agency level or that incomplete or inaccurate data were entered into the HMIS system. In addition, these data are subject to mode of administration bias in which the end user or client intentionally or unintentionally alters their responses to be more of less favorable. Finally, all VI-SPDAT responses are self-reported, in some cases retrospective, and often associated with activities that are societally stigmatized, and thus subject to both social desirability and recall bias.

5.4 Implications for Research and Practice

A civic scholarship paradigm asserts that to improve civil society, scholars must use their professional expertise to invest in scientific knowledge production that can facilitate action and change (Checkoway, 2008; Coulton, 2005). This study examined systemic inequity and homelessness within the paradigm of civic scholarship with the hope that the

knowledge generated will be used to inform equitable solutions and local and public discourse and policy on the topics of housing resource prioritization and distribution.

Since the December 2020 announcement by the creators of the VI-SPDAT (OrgCode) that they would be phasing out support of the VI-SPDAT and the call to create a prioritization tool or approach through a race equity lens that addresses racial and gender inequities, CoCs have been seeking alternate solutions for the VI-SPDAT and have been encouraged by HUD to create more equitable, community-based approaches. This time of transition has created a unique opportunity to reconceptualize how homeless service systems approach the allocation of scarce resources. Studies such as this one that examine existing prioritization tools can provide critical insights into how specific conceptualizations of risk and vulnerability may vary by demographic characteristics and across sub-populations of persons experiencing homelessness. Such research also has the potential to inform improved tools, approaches, and processes and ensure equitable allocation of scarce housing resources. Shinn and Richard (2022) assert that when CoCs consider how they should approach the allocation of scarce resources they should consider how their community conceptualizes and defines vulnerability, what tools are available or needed to measure it, what factors determine who should be prioritized for resources, and how concepts and measures of vulnerability are related to determination of appropriate housing intervention. Since the initiation of this study, the local CoC has engaged in intentional work to identify and develop an alternate tool and approach to prioritization and the VI-SPDAT continues to be a part of that process. Findings from this study will be shared with the community for consideration as they continue to work

toward the goal of developing equitable assessment tools and approaches via participatory methods.

As illustrated by the results of this study, there is variability in homeless services programmatic outcomes by race and by sub-population status. Black individuals were less likely than White individuals to exit to temporary or permanent situations. In addition, across sub-populations, there was greater likelihood that sub-population members would exit to permanent housing destinations. While ideally the goal is that a person exit to a permanent housing situation, these findings highlight the possibility that Black individuals, unaccompanied youth, veterans, and persons who have experienced domestic violence are facing barriers that hinder their access to temporary housing situations such as emergency shelter and transitional housing (including clinical and treatment-based programs) and are less likely to access non-jail institutional situations such as psychiatric, medical, or substance use facilities and/or long-term care. Additional research is needed to evaluate how exit destination may vary by race and sub-population and specifically which types of temporary or institutional destinations are groups most unlikely to exit. Determining gaps in access, even for temporary and institutional exits, is important to ensure fair and equitable access to all resources of the homeless services system. Further additional research is needed on the specific types of permanent housing exit destinations by race and sub-population. As previously mentioned, community exit data suggests a significant number of persons (particularly Black persons) exit the homeless services system to friends or family which is considered a permanent housing situation. Determining which types of permanent housing exits are most prevalent by race and sub-population could not only give insight into whether there are potentially racial

and sub-population specific barriers to accessing specific types of permanent housing resources but also provide insight into the housing resources that might most quickly end a person's homelessness.

An impetus for this research was that analyses of local and multi-CoC HMIS data raised concerns about whether the VI-SPDAT exhibited measurement equivalence across varying identities (including race and sub-population membership) and if there was variation in overall scores by identities. Previous research has suggested that people of color were seemingly negatively impacted either by the VI-SPDAT, the way the VI-SPDAT was administered, systemic racism, flawed policies, or a combination of these factors. To this end the Charlotte-Mecklenburg community formed a working group to evaluate the VI-SPDAT and the community's conception of vulnerability. Through that work, the community came to consensus on a definition of vulnerability that extended beyond frequent service use and risk for mortality. The revised conceptualization of vulnerability includes exposure to structural inequality, service need, exposure to victimization and trauma, and medical vulnerability. In addition, the CoC asserted that there are differential experiences of vulnerability based on demographic characteristics and sub-population membership. Through a community-engaged process it was determined that there was not an existing assessment tool that captured the community's conceptualization of vulnerability. Instead, the community decided to retain the VI-SPDAT but supplement it with an additional local tool that assessed the community's full conceptualization of vulnerability. In addition, the community developed prioritization formulas for singles, families with minor children, unaccompanied youth, and parenting youth. These formulas weight the VI-SPDAT at 35% of an individual's total vulnerability

score. The supplemental tool is 45% of a person's vulnerability score and the remainder of each group's score is assessed using population specific risk factors for prolonged homelessness without a housing intervention. These risk factors were developed with the community and in tandem with subject matter experts. Even though the VI-SPDAT only accounts for the 35% of a person's total vulnerability score, differential scoring on overall VI-SPDAT score and subscale scores still has the potential to influence disparities in vulnerability scores and ultimately in how housing resources are prioritized and distributed in the community.

Race significantly predicted VI-SPDAT total score. Specifically, Black individuals scored 0.50 points lower than White individuals on the VI-SPDAT total score. As was previously mentioned, the effect size was extremely small which suggests that race alone has a relatively weak influence on VI-SPDAT total score. This study also found that race significantly predicted VI-SPDAT Risks and Wellness subscale scores with Black individuals scoring lower on both subscales than their White counterparts. This is an important finding because it tells us that for Black individuals, as well as veterans and unaccompanied youth, there is a reason we are seeing lower scores overall on the VI-SPDAT and it is related to responses and subsequent scores for these groups on the Risks and Wellness subscales. Across these populations there are lingering questions about how population membership may be impacting access to care and service utilization behavior. In relation to legal challenges and risk behavior, experiences with the criminal justice system and perceived impact of responses in relation to exploitation and survival behavior may be influencing responses on these items. The literature does suggest that these sub-populations utilize emergency services (with the exception of crisis

lines) at higher rates than their counterparts. However, the majority of the research was focused on the populations generally and not specific to persons experiencing homelessness. Additional research focused on persons experiencing homelessness is needed to better understand population specific experiences and behavior in relation to emergency services use interactions, risk for harm, legal issues, risk for exploitation, physical health such as chronic health issues, physical disabilities and healthcare access; substance use such as negative consequences related to housing as a result of substance use, mental health such as developmental or learning disabilities or mental health challenges that impact one's ability to live independently; tri-morbidity: the presence of physical health, substance use, and mental health challenges; medication management and adherence; and abuse and trauma and its subsequent impact on the current period of homelessness. Individual item analysis by race and sub-population would highlight specific disparities in responses and could be used to inform assessment questions to evaluate Risk and Wellness constructs.

Despite this highlighted need, if extant research suggests that generally there are high rates of similarity in the behaviors, experiences, and resource utilization measured by the VI-SPDAT across race and subpopulation, but specific races and sub-populations score lower on the VI-SPDAT tool, it suggest that the tool lacks measurement equivalence across race and sub-population in its measurement of behaviors, experiences, and resource utilization. Further, it suggest that there may be latent constructs (such as exposure to implicit and explicit racism in the structural environment) that are influencing tool responses and thus an individual's overall vulnerability score. If communities plan to continue using the VI-SPDAT they should consider how to

supplement it with measures that quantify the influence of the structural environment and mitigate any implicit bias.

Finally, what is notably missing from the VI-SPDAT and a consideration for a future version of this study's conceptual model, is the inclusion of the role of protective factors in mitigating vulnerability. Current assessments of vulnerability within the homeless services sector are almost entirely deficit based. That is, they examine the propensity for negative outcomes but do not take into consideration factors that may influence success or a more rapid exit from homelessness. Shifting the narrative of resource allocation to consider not only individual service and subsidy need but also individual strengths has the potential to reshape interventions and programming to better facilitate rapid exits from homelessness and decrease homelessness returns.

In relation to housing intervention classification, those who scored higher on the History, Risks, Socialization and Daily Function, and Wellness subscales were less likely to be classified for mainstream affordable housing or rapid rehousing vs. permanent supportive housing. Higher subscale scores would likely result in higher overall VI-SPDAT scores and higher scores are associated with being classified for permanent supportive housing. Identifying the source of disparity within each subscale by conducting an item analysis by race and sub-population would inform tool adjustments that could address disparities in subscale scores which ultimately influences an individual's overall score on the VI-SPDAT.

For unaccompanied youth, findings from this study also reflect the nature of unaccompanied youth homelessness. In response to the differential experience of homelessness by unaccompanied youth, the TAY-VI-SPDAT was developed. However,

there are many similarities in the questions on both the TAY-VI-SPDAT and the VI-SPDAT. The Risks and Wellness subscales ask almost identical questions with very slight wording variations or the addition or removal of a few questions per subscale. In this sample, there were significant differences between youth and non-youth on not only the overall VI-SPDAT score but also the History, Risks, and Wellness subscales. Given the similarity in questions between the TAY-VI-SPDAT and VI-SPDAT, it is likely that on the TAY-VI-SPDAT, unaccompanied youth may score lower on the History, Risks, and Wellness subscales compared to non-youth. Additional research is needed to examine if there are significant differences in scores for unaccompanied youth on the TAY-VI-SPDAT compared to the VI-SPDAT. It is possible that TAY-VI-SPDAT is not capturing unaccompanied youth's unique experiences, population specific behavior, and vulnerabilities, and risk factors.

Finally, in this study, propensity score matching was used to create balanced and comparable samples of persons experiencing homelessness using race as the "exposure". Sub-population membership was not included as a covariate in the match which resulted in some cases, in small sub-population samples that limited the analyses that were able to be conducted. To better examine the impact of sub-population membership, future studies should create matched samples using the sub-population as the exposure to better understand the influence of sub-population membership on overall and subscale scores and item responses.

5.6 Conclusion

This study examined systemic inequity and homelessness within the paradigm of

civic scholarship with the hope that the knowledge generated will be used to inform equitable solutions and local and public discourse and policy on the topics of housing resource prioritization and distribution. In this study, race and sub-population status significantly predicted VI-SPDAT total score. The variation in subscale scores by race and subpopulation suggests that the VI-SPDAT and its subscales may lack measurement equivalence. Understanding how VI-SPDAT scores and subscale scores vary by race and sub-population status is essential to avoid perpetuating inequities and ensuring the equitable provision of housing assistance resources. In practice, until recently, there was a one size fits all approach to vulnerability assessment despite some expert agreement that different populations express vulnerability differently and should be assessed with population specific tools (Levitt, 2015). Additional research including individual item analysis by race and subpopulation is needed to better understand disparities in responses. Such research has the potential to inform improved tools, approaches, and processes and ensure equitable allocation of scarce housing resources for all persons experiencing homelessness.

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APPENDIX A: VULNERABILITY INDEX SERVICE PRIORITIZATION DECISION

ASSISTANCE TOOL (VI-SPDAT 2.0): INDIVIDUALS

Table A.1

Vulnerability Index Service Prioritization Decision Assistance Tool (VI-SPDAT 2.0):

Individuals

BASIC INFORMATION
First Name
Last Name
Date of Birth
Consent to Participate
PRE-SURVEY
If person is over 60 years old, then score one
A. HISTORY OF HOUSING AND HOMELESSNESS
Where do you sleep most frequently?
If the person answers anything other than “shelter”, “transitional housing”, or “safe haven”, then score 1.
How long has it been since you lived in permanent stable housing?

In the last three years, how many times have you been homeless?
If the person has experienced 1 or more consecutive years of homelessness, and/or 4+ episodes of homelessness, then score 1.
B. RISKS
In the past 6 months, how many times have you...
Received health care at an emergency department/room?
Taken an ambulance to the hospital?
Been hospitalized as an inpatient?
Used a crisis service, including sexual assault crisis, mental health crisis, family/intimate violence, distress centers and suicide prevention hotlines?
Talked to police because you witnessed a crime, were the victim of a crime, or the alleged perpetrator of a crime or because the police told you that you must move along?

Stayed one or more nights in a holding cell, jail, or prison, whether that was a short-term stay like the drunk tank, a longer stay for a more serious offence, or anything in between?
If the total number of interactions equals 4 or more, then score 1 for emergency service use.
Have you been attacked or beaten up since you've become homeless?
Have you threatened to or tried to harm yourself or anyone else in the last year?
If "yes" to any of the above, then score 1 for risk of harm.
Do you have any legal stuff going on right now that may result in you being locked up, having to pay fines, or that make it more difficult to rent a place to live?
If "yes," then score 1 for legal issues.
Does anybody force or trick you to do things that you do not want to do?
Do you ever do things that may be considered to be risky like exchange sex for money, run drugs for someone, have unprotected sex with someone you don't know, share a needle, or anything like that?
If "yes" to any of the above, then score 1 for risk of exploitation.
C. SOCIALIZATION & DAILY FUNCTIONING

Is there any person, past landlord, business, bookie, dealer, or government group like the IRS that thinks you owe them money?
Do you get any money from the government, a pension, an inheritance, working under the table, a regular job, or anything like that?
If “yes” to question 10 or “no” to question 11, then score 1 for money management.
Do you have planned activities, other than just surviving, that make you feel happy and fulfilled?
If “no,” then score 1 for meaningful daily activity.
Are you currently able to take care of basic needs like bathing, changing clothes, using a restroom, getting food and clean water and other things like that?
If “no,” then score 1 for self-care.
Is your current homelessness in any way caused by a relationship that broke down, an unhealthy or abusive relationship, or because family or friends caused you to become evicted?
If “yes,” then score 1 for social relationships.
D. WELLNESS
Have you ever had to leave an apartment, shelter program, or other place you were staying because of your physical health?

Do you have any chronic health issues with your liver, kidneys, stomach, lungs, or heart?
If there was space available in a program that specifically assists people that live with HIV or AIDS, would that be of interest to you?
Do you have any physical disabilities that would limit the type of housing you could access, or would make it hard to live independently because you'd need help?
When you are sick or not feeling well, do you avoid getting help?
FOR FEMALE RESPONDENTS ONLY: Are you currently pregnant?
If "yes" to any of the above, then score 1 for physical health.
Has your drinking or drug use led you to being kicked out of an apartment or program where you were staying in the past?
Will drinking or drug use make it difficult for you to stay housed or afford your housing?
If "yes" to any of the above, then score 1 for substance use.
Have you ever had trouble maintaining your housing, or been kicked out of an apartment, shelter program or other place you were staying, because of:
A mental health issue or concern?
A past head injury?

A learning disability, developmental disability, or other impairment?		
Do you have any mental health or brain issues that would make it hard for you to live independently because you'd need help?		
If "yes" to any of the above, then score 1 for mental health.		
If the respondent scored 1 for physical health and 1 for substance use and 1 for mental health, score 1 for tri-morbidity.		
Are there any medications that a doctor said you should be taking that, for whatever reason, you are not taking?		
Are there any medications like painkillers that you don't take the way the doctor prescribed or where you sell the medication?		
If "yes" to any of the above, score 1 for medications.		
Has your current period of homelessness been caused by an experience of emotional, physical, psychological, sexual, or other type of abuse, or by any other trauma you have experienced?		
If "yes", score 1 for abuse and trauma.		
SCORING SUMMARY		
Domain	Possible Points	Results/ Recommendations
Pre-Survey	1	0-3 No housing intervention

A. History of Housing & Homelessness	2	
B. Risks	4	4-7 Assessment for Rapid Rehousing
C. Socialization & Daily Functions	4	
D. Wellness	6	8+ Assessment for Permanent Supportive Housing/ Housing First
Total	17	

APPENDIX B: VULNERABILITY INDEX SERVICE PRIORITIZATION DECISION

ASSISTANCE TOOL (VI-SPDAT 2.0): FAMILIES

Table B.1

Vulnerability Index Service Prioritization Decision Assistance Tool (VI-SPDAT 2.0):

Families

BASIC INFORMATION (FOR BOTH PARENTS OR CAREGIVERS)
First Name
Last Name
Date of Birth
Consent to Participate
PRE-SURVEY
If anyone in the household over 60 years old, then score one
CHILDREN

How many children under the age of 18 currently live with you?
How many children under the age of 18 are currently not living with your family but you have reason to believe they will be joining you when you get housed?
IF HOUSEHOLD INCLUDES A FEMALE, Is any member of the family currently pregnant?
Provide a list of all children's names and ages
If there is a single parent with 2+ children and/or a child aged 11 or younger, and/or a current pregnancy, then score 1 for family size
If there are two parents with 3+ children and/or a child aged 6 or younger, and/or a current pregnancy, then score 1 for family size
A. HISTORY OF HOUSING AND HOMELESSNESS
Where do you and your family sleep most frequently?
If the person answers anything other than "shelter", "transitional housing", or "safe haven", then score 1.
How long has it been since you and your family lived in permanent stable housing?
In the last three years, how many times have you and your family been homeless?
If the person has experienced 1 or more consecutive years of homelessness, and/or 4+ episodes of homelessness, then score 1.

B. RISKS
In the past 6 months, how many times have you or anyone in your family ...
Received health care at an emergency department/room?
Taken an ambulance to the hospital?
Been hospitalized as an inpatient?
Used a crisis service, including sexual assault crisis, mental health crisis, family/intimate violence, distress centers and suicide prevention hotlines?
Talked to police because you witnessed a crime, were the victim of a crime, or the alleged perpetrator of a crime or because the police told you that you must move along?
Stayed one or more nights in a holding cell, jail, or prison, whether that was a short-term stay like the drunk tank, a longer stay for a more serious offence, or anything in between?
If the total number of interactions equals 4 or more, then score 1 for emergency service use.
Have you or anyone in your family been attacked or beaten up since you've become homeless?
Have you or anyone in your family threatened to or tried to harm yourself or anyone else in the last year?
If "yes" to any of the above, then score 1 for risk of harm.

Do you or anyone in your family have any legal stuff going on right now that may result in you being locked up, having to pay fines, or that make it more difficult to rent a place to live?
If “yes,” then score 1 for legal issues.
Does anybody force or trick you or anyone in your family to do things that you do not want to do?
Do you or anyone in your family ever do things that may be considered to be risky like exchange sex for money, run drugs for someone, have unprotected sex with someone you don’t know, share a needle, or anything like that?
If “yes” to any of the above, then score 1 for risk of exploitation.
C. SOCIALIZATION & DAILY FUNCTIONING
Is there any person, past landlord, business, bookie, dealer, or government group like the IRS that thinks you or anyone in your family owe them money?
Do you or anyone in your family get any money from the government, a pension, an inheritance, working under the table, a regular job, or anything like that?
If “yes” to question 10 or “no” to question 11, then score 1 for money management.
Does everyone in your family have planned activities, other than just surviving, that makes them feel happy and fulfilled?
If “no,” then score 1 for meaningful daily activity.

Is everyone in your family currently able to take care of their basic needs like bo athing, changing clothes, using a restroom, getting food and clean water and other things like that?
If “no,” then score 1 for self-care.
Is your family’s current homelessness in any way caused by a relationship that broke down, an unhealthy or abusive relationship, or because family or friends caused you to become evicted?
If “yes,” then score 1 for social relationships.
D. WELLNESS
Has your family ever had to leave an apartment, shelter program, or other place you were staying because of your physical health?
Do you or anyone in your family have any chronic health issues with your liver, kidneys, stomach, lungs, or heart?
If there was space available in a program that specifically assists people that live with HIV or AIDS, would that be of interest to anyone in your family?
Does anyone in your family have any physical disabilities that would limit the type of housing you could access, or would make it hard to live independently because you’d need help?
When someone in your family is sick or not feeling well, do you avoid getting help?
If “yes” to any of the above, then score 1 for physical health.

Has your drinking or drug use led you or anyone in your family to being kicked out of an apartment or program where you were staying in the past?
Will drinking or drug use make it difficult for you or anyone in your family to stay housed or afford your housing?
If “yes” to any of the above, then score 1 for substance use.
Has your family ever had trouble maintaining your housing, or been kicked out of an apartment, shelter program or other place you were staying, because of:
A mental health issue or concern?
A past head injury?
A learning disability, developmental disability, or other impairment?
Do you or anyone in your family have any mental health or brain issues that would make it hard for you to live independently because you’d need help?
If “yes” to any of the above, then score 1 for mental health.
If the family scored 1 for physical health and 1 for substance use and 1 for mental health, score 1 for tri-morbidity: Does any single member of your family have a medical condition, mental health concern, and experience problematic substance use?
If “yes”, score 1 for tri-morbidity
Are there any medications that a doctor said you or anyone in your family should be taking that, for whatever reason, you are not taking?

Are there any medications like painkillers that you or anyone in your family don't take the way the doctor prescribed or where you sell the medication?
If "yes" to any of the above, score 1 for medications.
Has your family's current period of homelessness been caused by an experience of emotional, physical, psychological, sexual, or other type of abuse, or by any other trauma you have experienced?
If "yes", score 1 for abuse and trauma.
E. FAMILY UNIT
Are there any children that have been removed from the family by child protective services within the last 180 days?
Do you have any family legal issues that are being resolved in court or need to be resolved in court that would impact your housing or who may live in your housing?
If "yes" to any of the above, score 1 for family legal issues
In the last 180 days have any children lived with family or friends due to your homeless situation?
Has any child in the family experienced abuse or trauma in the past 180 days?
IF THERE ARE SCHOOL AGED CHILDREN, Do your children attend school more often than not each week?
If "yes" to any of questions 34 or 35, or "no" to question 36, score 1 for needs of children

Have the members of your family changed in the last 180 days due to things like divorce, your kids coming back to live with you, someone leaving for military service or incarceration, a relative moving in, or anything like that?		
Do you anticipate any other adults or children coming to live with you within the first 180 days of being housed?		
If “yes” to any of the above, score 1 for family stability		
Do you have two or more planned activities each week as a family such as outings to the park, going to the library, visiting other family, watching a family movie, or anything like that?		
After school or on weekends or days when there isn’t school, is the total time children spend each day where there is no interaction with you or another adult....		
3 or more hours per day for children aged 13 or older		
2 or more hours per day for children 12 or younger		
Do your older kids spend 2 or more hours on a typical day helping their younger sibling(s) with things like getting ready for school, helping with homework, making them dinner, bathing them, or anything like that?		
If “no” to question 39, or “yes” to questions 40 or 41 , score 1 for parental engagement		
SCORING SUMMARY		
Domain	Possible Points	Results/ Recommendations
Pre-Survey	2	0-3 No housing intervention

A. History of Housing & Homelessness	2	
B. Risks	4	4-8 Assessment for Rapid Rehousing
C. Socialization & Daily Functions	4	
D. Wellness	6	9+ Assessment for Permanent Supportive Housing/ Housing First
E. Family Unit	4	
Total	22	

